# The Chemical Age

**A Weekly Journal Devoted to Industrial and Engineering Chemistry**

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*NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.*

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## The Faraday Commemoration

THE centenary celebration this week of Faraday's discovery of benzene was a dignified and impressive ceremonial, and it had several excellent effects. Through the lecture of Sir William Pope and the various appreciations of Faraday's character and work delivered in the famous theatre where he lectured for so many years, the members of his own and kindred sciences recovered afresh something of the high and noble spirit in which Faraday dedicated his life to the service of knowledge and truth. The celebrations brought together some of the most distinguished minds of other lands to make reverent acknowledgment of their indebtedness to a great Englishman and to demonstrate the unity of mind and spirit in which scientists of every nation pursue their work for mankind. To the public—though, we fear, in much too faint a degree—it conveyed some hint at least of what the discovery of one new fact may ultimately come to mean to civilisation, and of the almost incalculable material benefits that may follow one forward step in pure research. Few could have taken part in the celebrations without feeling the inspiration of a great occasion. To the Royal Institution, and especially to Professor H. E. Armstrong, who brought an infectious enthusiasm to the ordering of the practical arrangements and himself gave a brilliant analysis of Faraday as a man and as a chemist, the thanks of all are due.

Looking back on all that was said by men differing in language and race but all one in their service of science, many ideas and impressions could be recalled. There is room to mention only a few. The first, perhaps, is the general recognition that Faraday's greatness was enhanced, not diminished, by the humble condition of his early days. The Duke of Northumberland, whose speaking had the maturity of a man of twice his years, singled out Faraday's choice of science in the place of wealth as the keynote in a fine character. Sir William Pope gave us with a few clean strokes a portrait of the blacksmith's son, who received a loaf per week out of public relief when nine years old, and who later distributed newspapers on Sundays and became apprenticed to a bookbinder. It was pleasant to hear, near the close of Tuesday's proceedings, M. Paul Kestner's testimony that the English term of "self-made man" usually denotes a gentleman, and that England has produced more great men from humble homes than any other country. There was no patronage in all this, but merely evidence that in the world where character, scholarship, and service rule, snobbery has no place. Even deeper than this went Professor Armstrong when he showed us, under the glow of his fine words, Faraday's bare laboratory transformed into a sort of temple.

Many speakers, as was natural, dwelt on the marvellous developments issuing from the far-off work of one mind—the creation of industry after industry and the addition of comfort, convenience and beauty to the conditions of daily life. From the Duke of Northumberland came the reminder that in science alone could be found the solution of problems so baffling to this generation; from Sir Alfred Mond that the progress of humanity was only possible through the conquest over Nature and the utilisation of her boundless wealth; from Lord Balfour that while the storms of political controversy raged the great worker within the walls of the Royal Institution was having a far greater effect upon the development of civilisation, upon the welfare of mankind, than all the wordy disputes of the politician. Nor, great as the developments from such discoveries as Faraday's have been, can they be considered yet exhausted. Industry has been slow in turning them to practical account, and the harvest yet in store may be even richer than that already reaped.

There was one incident, small in itself but highly significant, which may well be rescued from oversight. It was the announcement that the first recipient of the Faraday centennial medal is to be Mr. James Morton, of Carlisle and Grangemouth, in recognition of the service he has rendered to chemical science and industry in this country during the last ten years by developing and extending the manufactures of anthracene dyestuffs and more recently by extending their application

to silk and wool. Ten years ago Mr. Morton was little known in chemical industry. He was known as the producer of beautiful fabrics, the manufacture of which, when his supply of dyestuffs was cut off by the war, was suddenly arrested. So he set about making his own. And in less than ten years the mysteries of the science of dyestuff production have not only been mastered, but he has carried the science a great stage forward. Not from himself will the public hear anything about the achievement; the most they may hear will be a word of appreciation of a loyal and enthusiastic staff of researchers and technicians. But the Royal Institution has refused to overlook so signal a success, and in making him the first Faraday medallist has paid honour where it is due.

## A Question of Power

WHILE speaking of the activities of the Institution of Gas Engineers it is worth while drawing attention to the views expressed at the meeting in connection with the programme which the Government have in hand for the development of a supply of cheap electrical energy throughout the country. Power, and cheap power, it will usually be argued, is a *sine qûa non* if industry is to hold its place in the markets of the world. The chemical industry in all its many-sided phases is as dependent upon power in some form or another as is any other industry, but it must be frankly admitted that the incidence of the power factor on the ultimate cost of the article or product marketed seems to have become a trifle over-estimated. Some seem to have accepted the parrot cry of "Cheap Energy" without really getting down to bed rock and considering what proportion of the total cost of a finished product is represented by this item. There is, accordingly, some danger that the Government may spend its proposed millions in subsidies to the electrical industry only to find when it is too late that it has been fostering a gross misconception. One need not discuss whether the artificial stimulus of an industry is right or wrong in principle, even though it has up to the present been regarded as essentially contrary to the fiscal policy of the country. It cannot exactly be said that the granting of subsidies to industry is without precedent, for the Government's participation during the war in the finances of some of our well-known industrial chemical undertakings was only another means of doing the same thing.

So far as the proposed electrical subsidy is concerned, however, one must be assured that not only is this going to assist us in regaining lost markets by cheapening production, but, more important still, we must bear in mind that our national wealth lies largely in our coal resources, and it would seem to demand nothing more than common sense and elementary arithmetic to grasp that the highest efficiency in the utilisation of coal is obtained by carbonisation and not by direct combustion under steam boilers for the generation of electrical energy. Again, Mr. Ferguson Bell, the President of the Institution of Gas Engineers, gave his audience some figures relating to an examination which he had made of the power costs in industry. In most industries he found that the percentage for power costs (as compared with production costs for materials, labour, rates, and overhead charges) varies from 1 to 5 per cent. only. Hence, the plausible cry that industry will revive if only producers can obtain motive power at abnormally low rates savours of being a misleading promise of the professional doctrinaire. At the outside, power at half the present rates would lead to a reduction of $2\frac{1}{2}$ per cent. in cost of manufacture, and this is wholly insufficient to put us on the road to a trade boom. Truly, this electrical subsidy business calls for unusually careful scrutiny.

## Tar *v.* Bitumen

IN our issue of May 16 last we drew attention to the rather sweeping suggestion in the Report issued by the Standing Committee on Rivers Pollution in connection with the relative merits of coal tar and bitumen as road dressings. The statement which appeared in the Report amounted to little less than a severe condemnation of tar and a vindication of bitumen, and we suggested at the time that it would be well if those representing the carbonisation industries were to take up the challenge without delay and issue a statement from their own side of the question. No one will doubt in the least that the Committee arrived at what is a perfectly sincere conclusion drawn from certain scientific experiments which they were able to conduct, and which are quoted to lend strength to their arguments. Criticism of this type is genuine and helpful, and is likely in the long run to assist those who manufacture the material upon which strictures are passed to alter their methods and review their processes until means are found for eliminating the objectionable properties, that is, of course, assuming that the latter exist. One cannot, however, in any sense condone criticism of the flippant type which is not backed up by general experience, and we feel that it is a matter for regret that Sir Henry Maybury should have been reported as saying that present-day tar will "stick to everything except the road."

This unfortunate statement was not, happily, permitted to go unchallenged for long, and the occasion of the annual meeting of the Institution of Gas Engineers, every member of which is closely associated with the production of coal tar, provided a fit occasion for refuting it. Mr. D. Milne Watson very aptly chose an opportunity for expressing his opinion on the tar *versus* bitumen controversy when the President of the Board of Trade was present, and he rightly remarked that it was a scandal that such a thing should have been said of a British product, and that an attempt should have been made to persuade local authorities to use imported bitumen instead of the product of one of our leading public service industries. Sir Philip Cunliffe-Lister is evidently prepared to accept the facts as he finds them for himself, for he drew attention to certain roads which are regarded as having set the standard for road construction in this country, and he was informed by Dr. Carpenter that on those roads coal tar was used, and that they were a model which should have been generally followed. Moreover, the tar was used at the instigation of Sir Henry Maybury. It cannot be too strongly emphasised that the result of too hastily expressed opinions in a case such as this may be very much more far-reaching than might by the uninitiated be supposed, for the price which the public consumer has to pay for his gas is largely determined

by the revenue derived from the by-products of carbonisation, of which products tar stands second in importance. The question, therefore, is one which not merely affects the interests of a particular industry, but involves the community as a whole.

## Business and Politics

THE Great Western Railway Co. is raising six millions of new capital, which, if we understand the Chairman's explanations aright, it does not really want. The incident is worth noting as illustrating the complications that arise out of the modern habit of regulating and arranging by legislation every sort of industrial activity. It will be remembered that the Railway Rates Tribunal is charged with the duty of fixing the rates and charges of each group of railways. These rates have to be such as will, together with the other sources of revenue, in the opinion of the Tribunal, so far as practicable yield, with efficient and economical working, an annual net revenue equivalent to that of the year 1913, with certain additional allowances as prescribed by the Act. One of these is such an allowance as may be necessary to remunerate additional capital raised or provided in respect of new expenditure on capital account incurred since January 1st, 1913. The Great Western Railway has, in fact, spent six millions on capital account since 1913, and rightly wants to secure a return upon this additional capital expenditure. It has, however, or so it would seem, committed the indiscretion of financing this expenditure out of its own reserves, without raising additional capital, and the Railway Rates Tribunal, interpreting the Act in that strict and literal way which is necessary with these bodies, cannot allow a return upon expenditure which is not represented by "new" capital. The result would appear to be that six millions must be taken from investors, added to the surplus funds of the Great Western, thus increasing the capital burden of this undertaking, all to comply with the letter of the law. There is, however, from the business point of view a much more serious aspect of this matter. It would appear as if it is no longer worth the while of a railway company to make reserves, as obviously shareholders cannot be asked to reinvest a portion of their profits in this way if no return is legally obtainable upon such reinvestments.

## American Visitors

AT present we are glad to welcome a group of American chemical visitors, who are making a study of European conditions. They include among several others Professor Norris, the President of the American Chemical Society, and Mr. Whittaker, the head of the American Association of Synthetic Organic Chemical Manufacturers. Professor Norris, who served in England during the war as a liaison officer and knows us now fairly well, told us at the Faraday dinner in the Goldsmiths' Hall on Tuesday evening two things of direct interest. The first was that the old pre-war suspicion of the Britisher has passed and given way to a better understanding and kindlier feeling. He told us also, as Chief of the National Research Council of the United States, something of the attitude of American business men towards research. It has become the fashion there among business men to talk research, even when they do not understand very much about it. It is considered what we should call good form. But what was most encouraging was to hear of the growing understanding and intimacy between the pure research undertaken by the State and the more applied research which is the province of industrial concerns, and the general recognition now that the latter is next to impossible without the former. We, too, are learning something of the same thing through the work of our industrial research associations. The fundamental work must precede the specialised technical work if the latter is to be really effective, and from this point of view we may regard the new National Chemical Research Laboratory at Teddington, where Professor Morgan begins his important work in September, as a step of high significance and promise.

## Points from Our News Pages

A detailed description of the Faraday celebrations (p. 602).

Sir Max Muspratt gives important impressions of Germany's industrial outlook. A report and picture are also given of the opening of the United Alkali Co.'s new sports ground (p. 608).

Chemical trade returns for May are distinctly favourable. Exports are up and imports down compared with April results (p. 610).

Twenty-seven nations have signed the Protocol condemning the use of chemical warfare (p. 613).

Our London market shows rather better tone, and export demand in some cases is quite brisk (p. 618).

In the Scottish market, in consequence of another attempt to form a syndicate, manganese chloride is quoted 30s. per ton higher (p. 621).

### Books Received

AN INTRODUCTION TO FLUID MOTION. By W. N. Bond. London: Edward Arnold and Co. Pp. 94. 5s.

LE PRINCIPE DE SYMÉTRE ET SES APPLICATIONS.—By F. M. Jaeger. Paris: Gauthier-Villars et Cie. Pp. 417. 55 fr.

REFRIGERATION IN THE CHEMICAL INDUSTRY. By G. W. Daniels. London: A. J. Rayment, 15, Dartmouth Street, S.W.1. Pp. 141.

THE MICROSTRUCTURE OF A COAL SEAM. By J. Lomax. Fuel Research Board Technical Paper No. 11. London: H.M. Stationery Office. 4s. 6d.

THE FATS (Monographs on Biochemistry). By J. B. Leathes and H. S. Raper. London: Longmans, Green and Co. Pp. 242. 12s. 6d.

THE TECHNOLOGY OF WOOD DISTILLATION. By M. Klar, translated by Alexander Rule. London: Chapman and Hall, Ltd. Pp. 496. 25s.

A CATALOGUE OF BRITISH SCIENTIFIC AND TECHNICAL BOOKS. By the British Science Guild. London: A. and F. Denny, Ltd. Pp. 490. 12s. 6d.

MONEY AND MINES. By Hugh Frederick Marriott. London: Ernest Benn, Ltd. Pp. 270. 15s.

CHEMICAL SYNONYMS AND TRADE NAMES. By William Gardner. London: Crosby Lockwood and Son. Pp. 328. 30s.

## The Calendar

| | | |
|---|---|---|
| 1925 June 23 | National Physical Laboratory: Annual visit of inspection. 3 to 6 p.m. | Teddington. |
| 24 | Society of Glass Technology: Papers by Professor W. E. S. Turner and F. Winks. 2.30 p.m. | University College, Gower Street, London. |
| July 13 to 18 | Society of Chemical Industry: Annual Meeting. | Leeds. |
| Aug. 26 to Sept 2 | British Association for the Advancement of Science. | Southampton. |

# Centenary of Faraday's Discovery of Benzene

## Representative Celebrations in London

*On Tuesday, at the Royal Institution, the Centenary of Faraday's Discovery of Benzene was celebrated by a gathering representative of science throughout the world. In the evening there was a banquet in the Goldsmiths' Hall. On the previous Friday a commemorative lecture on "Faraday as a Chemist" was delivered by Sir William Pope. Reports of the proceedings are given below.*

THE celebrations which marked the centenary of Faraday's announcement of his discovery of benzene were opened on Tuesday, June 16, at the Royal Institution, by a reception of representatives of British and foreign scientific and industrial bodies. The representatives were received by the Duke of Northumberland (President of the Royal Institution). It was in this building that Faraday made his discovery, which was announced to the Royal Society on June 16, 1825.

At the reception, Diplomas of Honorary Membership of the Royal Institution were presented to a number of foreign delegates, addresses were presented on behalf of scientific and industrial bodies in all parts of the world, and telegrams and cables were received from scientific bodies in India, Australia, New Zealand and South Africa. A banquet was held in the evening at the Goldsmith's Hall, London, at which the delegates were entertained.

### The President's Welcome

The DUKE OF NORTHUMBERLAND, who welcomed the delegates at the reception, said that they had met for the purpose of commemorating the 100th anniversary of one of the most epoch-making events in the history of scientific discovery, and to honour the discoverer—one of the most brilliant names, not only in the long and glorious roll of the Royal Institution, but in that of the world's pioneers in science. They were fulfilling the two objects of commemorating the event and honouring the discoverer in the most appropriate manner, namely, by the joint action of the Royal Institution and the three bodies representative of chemistry in this country (the Chemical Society, Society of Chemical Industry, and the Association of British Chemical Manufacturers), in holding a meeting and a reception on the scene of that discovery, at which all the great nations of the world were represented, which nations, through their representatives, would testify to the immense benefits conferred upon civilisation by Faraday's genius. The Royal Institution accorded them a most cordial welcome and warmly appreciated their presence.

But they were not met merely to celebrate a great scientific discovery or to express the pride of our nation or of the Institution in that achievement, however proper such sentiments might be. What they wished above all things to do was to call the attention of the rising generation to the motives which inspired Faraday's life, which made him not only a great scientific genius, but a great man, and to inspire them to emulate the example he had set. There could be no nobler testimony to Faraday's greatness, both as a scientist and as a man, than that of John Tyndall, who was so closely associated with him for many years. After showing how Faraday had to decide whether he should make wealth or science the pursuit of his life, he had thus summed up the result of that choice: "Taking the duration of his life into account, this son of a blacksmith and apprentice to a bookbinder had to decide between a fortune of £150,000 on the one side and his undowered science on the other. He chose the latter, and died a poor man. But his was the glory of holding aloft among the nations the scientific name of England for a period of forty years."

#### Two Eminent Qualities

As a scientific discoverer, Faraday's greatness consisted in two eminent qualities. The first was his trust in facts—his profound belief in and love of experiment, and the second was his imagination, amounting, as his biographer had said, "to divination or scientific second sight," a power of correctly anticipating the most wonderful discoveries.

Of all those discoveries, that of benzene had perhaps had the greatest material effect upon the world, not only as being the foundation of a major section of organic chemistry, and therefore of immense scientific value, but because it was directly or indirectly the raw material from which all the manufactured dyestuffs now in use were made.

What Faraday accomplished in his time could be achieved by the rising generation of scientists to-day. Scientific truths and principles of even greater importance were waiting to be discovered, vast fields of knowledge were awaiting development, and it was to be hoped that, in the interests of civilisation as a whole and of British science in particular, the lessons of his life would not be forgotten. But if such work were to be done, if the Royal Institution were to play its true part in the march of progress, if the future were to bring forth new Davys, Faradays and Dewars, if this country were to lead all others, as it had done in so many branches of science, we must see to it that the nation should profit from their efforts. We who had led in the discovery of chemical dyes had seen the great industry which had resulted from it pass into foreign hands, and others secure the birthright which belonged to us. He was very glad to say, however, that that situation was now being fundamentally altered, and that we were regaining, if we had not already regained, the position which by right belonged to us in that great industry.

The most distressing feature of the times was our failure to link up scientific methods and discovery with the public service. The manufacturer and producer was slow enough to recognise the value of scientific research, even when the profit to himself should be apparent; but the statesman was still slower to recognise the immense benefits which the nation could derive from the encouragement of research. The discoveries of the past, one of the greatest of which was celebrated that day, as well as the urgent necessities of the present situation, were a testimony to the paramount importance of the Royal Institution as the focus point of scientific discovery, one of the great world-centres for the production of scientific knowledge. What the Royal Institution had achieved for science in the past was small to what it might achieve in the future if the public would only realise the vast assets which the nation possessed in the brains and the knowledge of its scientists and in the potentialities of its laboratories if adequately developed and equipped. Above all, let them hope that the younger scientists of to-day would remember that what the world had gained by the discovery of benzene was nothing to what it might gain by their endeavours if they followed in the footsteps, inspired by the ideals, of him whom they were honouring that day.

### Diplomas of Honorary Membership

Diplomas of Honorary Membership of the Royal Institution were then presented to the following, the secretary making a short statement concerning the work of each recipient.

Professor G. E. Bertrand (Professor of Bio-Chemistry, Pasteur Institute, Paris), who is distinguished as an inquirer into bacterial activity, particularly in connection with oxidation phenomena, of which he has made a special study. He has also paid great attention to the influence of minute quantities of metals not usually regarded as acting upon the course of vital change.

Professor Ernst J. Cohen (Professor of Chemistry, University of Utrecht, Holland), an acknowledged leader in physical chemistry, the biographer in English of his master Van't Hoff and, like him, a devoted student of Byron.

Prince Ginori Conti (Italy), who has captured natural steam and used it as a source of energy, at the same time extracting from it large quantities of boric acid. He manufactures perborates from this latter by Faraday's method of electrolytic oxidation. (Prince Ginori Conti was represented at the reception by Dr. Antonio Nasini.)

Professor F. J. Norris (President of the American Chemical Society, Professor in the Massachusetts Institute of Technology, and himself a well-known original worker).

Professor Joji Sakurai (President, Japanese National Research Council). He was a student under the late Professor A. Williamson at University College, London. Working upon foundations laid by the late Professor Divers, he has long been

noted as the inspiring mind in Japanese chemistry. A founder of the National Research Council of Japan, he is now actively engaged in promoting the application of science generally in his country. (Professor Sakurai was represented by Professor M. Katayama.)

Professor F. Swarts (Professor of Chemistry, University of Ghent, Belgium), distinguished as a student of the organic compounds of fluorine.

## An Appreciation of Faraday

PROFESSOR H. E. ARMSTRONG, in an appreciation of Faraday, said that an indescribable feeling of deepest reverence thrilled those who knew that they were within a holy of holies when standing at the table whence Davy and Faraday and Dewar had disclosed their discoveries to the world. Of them that had left a name behind them, Faraday was one of the greatest, certainly the greatest experimental philosopher the world had yet known. Deeply religious from his childhood upwards, he had advisedly kept his science apart from his religion, but his moral faith was ever the background of his scientific productivity. His work was all conceived and executed in a deeply religious spirit. It would only be by following his example that wisdom would be made the religion of the people. We of the world of science to-day were too prone to speculate, often too inconsiderate in speculation, too little bent upon cultivating that breadth of vision and proportionate judgment which was at the root of scientific method. Overcome by the ecstasy of practical achievement, we were too little mindful of the public interest. We were doing too little to make scientific method a public possession. Faraday's dream was in no way fulfilled; the spirit of science in no way entered into our commerce, into our industry, into our public life.

They sought that day to call attention to Faraday's splendid greatness as a chemist. He was generally thought of in connection with electrical discovery, but it was significant that he began his career as a chemist, that he grew up in the severity of a proper chemical discipline, just at the time, however, when electricity was coming into vogue. Inspired by his great master, Sir Humphry Davy, fascinated by the wonderful use Davy had made of electric current in liberating the alkali metals and in discovering the nature of so common a substance as lime, gifted with marvellous power of insight, and unhampered by the mass of detail which encumbered our modern thought, he could not do otherwise than recognise the reciprocal, inseparable nature of chemical and electrical phenomena. He had ultimately proclaimed the essential unity of chemical and electrical change, not yet generally recognised by chemists, though in these days even matter is regarded as of electrical origin. We had yet to acknowledge Faraday's prescience, and the consequences of this, his prime discovery.

### Range of His Chemical Activities

The range of Faraday's chemical activity was astounding, the more so when we considered his slender equipment, and the fact that he did almost everything himself. As one of the earliest workers in organic chemistry he stood pre-eminent. His discovery of benzene would always rank as one of the most fundamental discoveries of chemistry. If not the hub of the organic section of our chemical universe, benzene was at least a major part thereof. Our edifice, in fact, had two foundation stones: one the simple carbon atom which could be extended endlessly, as links in a chain, and the other a closed complex unit of six carbon atoms, ranged as in the diamond, and associated symmetrically with six atoms of hydrogen. This latter we called benzene. It was, in fact, just a bit of diamond, mounted and preserved in hydrogen, as though it were aspic. The beauty of the diamond, however, was as nothing compared with that of benzene, in the eyes of its many mistressses. Faraday separated benzene from the products of the decomposition of oil by heat. Beginning his investigation on April 26, 1825, he soon isolated benzene, and might be said to have discovered it on May 24, the day on which he first determined its composition by an operation, itself a wonderful experimental "tour de force"; the memoir in which he submitted his discovery to the Royal Society was dated June 16. Having studied a material such as Faraday used, and knowing its complexity, Prof. Armstrong said he was astounded at the rapidity with which Faraday had carried out the inquiry, and the accuracy of his deductions. It was a work of astounding genius.

Benzene only acquired technical importance from 1856 onwards, when W. H. Perkin had entered upon his great adventure, at the age of nineteen. He had not only discovered the first aniline colour, mauve, but had founded the artificial dyestuff industry. To-day, the natural colouring matters were all but displaced by dyestuffs, often superior, derived more or less directly from benzene. Nothing that had happened since Faraday made his discovery would have given the philosopher greater pleasure than the advance in our knowledge of the origin of colour—a subject which had once filled his mind.

### A New Era

After discussing scientific progress up to the present time, Prof. Armstrong said that a new era is upon us, for which we must prepare ourselves. Like Faraday, we must have many-compartmented minds. We must think in the solid. The chemistry of the future would be spatial in dimensions and distribution; it would be in no slight degree a science of solid geometry. He exhibited a model of benzene in terms of units such as X-rays revealed to us in the diamond. Mr. William Barlow and himself desired to lay this upon Faraday's table as a solid tribute to his memory. It was something more than a mere symbol; they believed it to be a very close approach to the geometrical structure of the molecule. It was something he (Prof. Armstrong) had hoped for during the whole of his life. Other models, made by Mr. Barlow, were also exhibited, of various derivatives of benzene, all in close accordance with crystallographic data.

The occasion of the centenary of Faraday's discovery was no common occasion, and it was desired to deal with it in no common way. This commemoration was held at the instance of a remarkable and unusual conjunction, by the Royal Institution acting together with the Chemical Society, the Society of Chemical Industry, and the Association of British Chemical Manufacturers—a trinity completely representative of English chemical interests. Chemists desired to show that for once they could think together. Together they acclaimed the memory of Faraday—of Faraday the complete, philosophic chemist. Moreover, their Committee had decided to take in hand the preparation of a Medal, to be awarded at intervals, perhaps sextennially, without regard to nationality, for an outstanding achievement in some clear relation with Faraday's discovery of benzene. They desired not only to keep his influence alive, but to extend it, and proposed to make the first award, in anticipation, that day. They asked Mr. James Morton, of Carlisle and Grangemouth, to accept promise of the first Faraday Benzene Centenary Medal, in special recognition of the signal service he had rendered to chemical science and industry in this country during the past ten years by developing and extending the manufacture of the anthracene vat-dyestuffs and, more recently, by extending their application to silk and wool.

PROFESSOR ERNST COHEN followed with an appreciation of Faraday, who, he said, was one of the most astonishing geniuses and one of the noblest characters the world had ever produced.

## Presentation of Addresses

The following delegates were then received by the President, and presented addresses on behalf of their various scientific bodies:—

AMERICA.—Professor J. F. Norris (American Chemical Society); Dr. Trowbridge (National Academy of Science of America); and Professor Bartow (National Research Council of America).

BELGIUM.—Professor F. Swarts (Belgian Academy of Sciences and Belgian Chemical Society).

HOLLAND.—Professor von Romburgh (Dutch Academy of Sciences); and Professor Ernst J. Cohen (Dutch Chemical Society).

FRANCE.—Professor G. E. Bertrand (French Academy of Sciences and the French Chemical Society); and M. Paul Kestner (French Society of Chemical Industry).

ITALY.—Dr. Antonio Nasini (Italian National Federation for Chemical Industry).

JAPAN.—Professor M. Katayama (National Research Council of Japan).

SWITZERLAND.—Dr. Schedler (Swiss Chemical Society and the Swiss Society of Chemical Industry).

SPAIN.—Sir William J. Pope (Federation of Spanish Chemical Societies).

SWEDEN.—A short address was also received from the Royal Swedish Academy of Sciences.

GREAT BRITAIN.—Professor Thorpe (Royal Society); Sir William Pope (Chemical Society); Dr. E. F. Armstrong (Society of Chemical Industry); Mr. D. Milne Watson (Association of British Chemical Manufacturers); Mr. Hickson (Society of Dyers and Colourists); Professor F. G. Donnan (Faraday Society).

Addresses and messages of congratulation were also received from the following:—Great Britain, Institute of Chemistry; India, Indian Chemical Society; South Africa, Royal Society of South Africa, The South African Chemical Institution, The Chemical, Metallurgical and Mining Society of South Africa, and The South African Association for the Advancement of Science; Australia, Australian Chemical Institute; New Zealand, Auckland Chemical Society; Finland, Finland Society of Sciences.

### Earl Balfour on Science and Politics

EARL BALFOUR, expressing thanks to the Duke of Northumberland, the foreign delegates, and others who had taken part in doing honour to the memory of Faraday, said that no member of the Royal Institution could speak on such an occasion without feeling that they would have been indeed neglectful of their duty if they had not asked the world to join with them in celebrating the memory of one of the greatest men of science. They were celebrating one of a long series of discoveries which had succeeded each other with almost bewildering rapidity in the thirties of the last century, and which went on for many years after that. Those were years of profound political discussion, in which parties were bitterly divided, in which storms of political controversy swept from one end of these islands to the other, and he (Lord Balfour) had often thought how strange it would have seemed to the protagonists on either side if they could have been brought to believe and to realise that the quiet worker within the walls of the Royal Institution was having a far greater effect upon the development of civilisation, upon the welfare of mankind, upon the progress of commerce, and, more than all, upon the progress of knowledge, than anything which their doubtless important, but very wordy, disputes could produce. Nobody could have listened to the interesting speeches delivered that day without reflecting upon how extraordinary and varied had been the developments which had sprung from seeds of which Faraday was the original planter. Almost all, if not absolutely all, the most striking developments which had taken place either in the world of industrial production or in the world of scientific speculation, dated back to something associated with the name of Faraday, and profoundly and intimately connected with his discoveries. In the world of practice and in the world of theory, he was one of the greatest builders the world had ever seen. Science was going to be the great hope of the world as regards material development, but we must not ask science immediately to produce a full crop from the seed sown, or to arrange its business so that, when the seed was sown, a rich harvest would be reaped immediately.

The DUKE OF NORTHUMBERLAND also expressed thanks, on behalf of the Royal Institution, to all those who had paid such magnificent tribute to one who was the greatest of all the Institution's scientists. He also thanked Professor Armstrong and Professor Cohen for their excellent addresses.

A number of exhibits to illustrate Faraday's work were arranged at the Royal Institution for inspection by those attending the reception.

## The Banquet in the Goldsmiths' Hall

There was a large gathering at the banquet which was held in the evening at the Goldsmiths' Hall, when the Duke of Northumberland again presided. Among those present were Lord Blanesburgh, Lord Rayleigh, Sir Charles Sherrington, Professor G. E. Bertrand, Col. R. S. Clarke, Dr. A. W. Crossley, Professor Cohen, Sir William Pope, Mr. James Morton, Sir Alfred Mond, Bart., Professor Norris, Professor Swarts, Mons. P. Kestner, Professor Katayama, Professor W. H. Perkin, Principal Sir James Irvine, Sir Humphrey Rolleston, Professor Jocelyn Thorpe, Dr. Schedler, Sir Alfred Yarrow, Dr. E. F. Armstrong, Sir Waley Cohen, Lady Waley Cohen, Mr. D. Milne Watson, Mr. George Douglas, Professor van Romburgh, Sir Max Muspratt, Mr. W. W. Leuchars, Professor H. E. Armstrong, Professor E. and Mrs. Bartow, Sir John Bland-Sutton, Sir John Biles, Professor W. A. Bone, Sir William Bragg, Mr. F. H. Carr, Mr. A. Chaston Chapman, Sir Dugald and Lady Clerk, Sir James and Lady Crichton-Browne, Professor F. G. Donnan, Dr. Bernard Dyer, Mr. E. V. Evans, Sir Richard Gregory, Mr. S. Henshaw, Mr. Ernest Hickson, Sir E. Gowland Hopkins and Lady Gowland Hopkins, Sir Arthur Keith, Dr. Levinstein, Professor Lowry, Mr. G. K. Menzies, Professor G. T. Morgan, Mr. Emile Mond, Mr. Robert Mond, Sir Edward and Lady Pollock, Mr. W. T. Prideaux, Sir Robert Robertson, Mr. F. E. Smith, Dr. Trowbridge, Sir James Walker, Mr. W. J. U. Woolcock, Sir Almroth Wright, Professor W. Palmer Wynne and many others.

THE CHAIRMAN proposed "The Immortal Memory of Faraday." After the glowing and eloquent tributes to which they had all listened that morning, he said, there was no need for him to embellish the toast with a speech. He thought it better to leave it in its simplicity, and to let the words speak for themselves—"The Immortal Memory of Faraday, Chemist and Philosopher, Discoverer of Benzene."

### Chemical Science and Industrial Art

SIR ALFRED MOND, proposing "Chemical Science and Industrial Art," said they were celebrating the centenary of a discovery by one of those great and outstanding men to whom science was not divided into fields, but to whom science was one great field. Thus, when they talked of chemistry, they meant the term in its widest sense, as something overlapping and interlocking human activities and human ideas. It would be impossible in a long speech, much less in the few remarks he intended to make, to bring home the far-reaching consequences of the most abstract ideas of our daily lives. There was a close connection between chemistry, physics, biology and other sciences. Chemical science was fundamental to medicine, hygiene, agriculture, industry—in fact to life itself, and yet what little knowledge of it there was amongst those who ruled nations. The most abstract of thoughts, the most theoretical of discoveries, might open out endless avenues for future progress. Sir Alfred quoted from a paper read by his father, Dr. Ludwig Mond, in 1889, in which the author, referring to the position of chemical science, had said that the steady, methodical investigation of natural phenomena was the father of industrial progress. We need not now proceed, continued Sir Alfred, by hit or miss methods; we need not proceed empirically to try to solve our problems. We could attack them with method, with system, by mass investigation and mass research along well defined lines. In that manner the progress of the world was accelerated to a speed which was almost incredible. There were no shores to the boundless ocean of scientific knowledge. Generations of great minds had investigated its endless mysteries, constantly discovering new lines, but there was room for an endless succession of scientific Columbuses for generations yet to come. Each new discovery opened a way for more fundamental and still greater knowledge. The progress of humanity was marked in its successive stages by its conquest over nature and its utilisation of nature's boundless wealth. The future prosperity of the world, the solution of its economic difficulties, the security of its teeming millions, depended far more upon its scientific progress, upon its increased power to produce wealth by the application of scientific thought and method to its industrial problems, than to any other form of human effort. He coupled with the toast the names of Principal Sir James Irvine, Professor Norris, and Dr. E. F. Armstrong.

### Science and Character

PRINCIPAL SIR JAMES IRVINE, responding, said that that was a great day for the science of chemistry. Chemists had gathered not alone to celebrate a scientific discovery of world-wide importance, but to do homage to the memory of one who, equally in our time as in his own, was an inspiration to all scientific workers. His (Sir James's) mind was endeavouring to bridge the gap of a century, and to imagine what the master would have thought had he been with us still. In giving an account of our stewardship, we should be submitting ourselves

to a terrible test. Dare we hazard the question whether such a man would be satisfied with what we termed complacently a "century of progress." In retrospect there might be much to deplore, yet there was comfort in many things, among them the spirit of the toast which had been honoured. Commenting upon the story of what had been achieved through the chemists' labours, he said it was a wonderful story, yet it was known properly only to a few. It was his belief that it was as much a national duty to educate public and political opinion to appreciate the chemists' work as it was to educate the chemist himself. Turning to the influence of the chemical sciences upon character, he said that few men more than the chemist were exposed to temptations to forsake the work to which they were called. Every true chemist's life was a life of sacrifice; the leader of industry had to deny himself much of the solace of leisurely, scholarly, research, while his academic brother, in the pursuit of abstract truth, must cast himself off from the prospect of honour or material reward. We had before us the example of Faraday's own devotion to thankless and unrewarded tasks. We reflected on the steadfast purpose which made him relinquish his fees and even refuse the highest scientific honour of the country—the Presidency of the Royal Society, and were proud to remember that this spirit still lived.

### A Message from America

PROFESSOR NORRIS (President of the American Chemical Society), after expressing his appreciation of the courtesy which English chemists had extended to him, referred to the work of the great industrial research laboratories in the United States, in which all their energies were devoted to the detailed study of matters which had been discovered in the academic laboratories. During the last year he had been Chairman of the Division of Chemistry and Chemical Technology of the National Research Council of the United States, and one of his most interesting and important duties was to visit the chemical research laboratories of the United States. There he could see the relationship between chemical science and industrial art, and how the industrial research laboratories were utilising the results obtained in the academic laboratories. There was arising slowly a co-operation between the universities and industry which would lead to a tremendous advance in the relationship between the two. Up to the time of the war there was considerable demarcation between the industrial laboratories and the university laboratories, but, as a result of the efforts of the Research Council, that condition would be changed. In America they were fostering the development of petroleum, and he expressed the hope that in years to come there would be a great celebration proclaiming the establishment of great industries based upon petroleum development. Professor Norris also referred to the 50th Anniversary of the American Chemical Society, which is to be celebrated next September, and extended a cordial invitation to representatives of British Chemistry at those celebrations.

### The Utilisation of Chemical Discoveries

DR. E. F. ARMSTRONG said that the question "What is the use of the discoveries of the scientist?" was still the bugbear of the chemist of this country. Far too many of our industrial magnates still looked with suspicion on pure science, and were not prepared to wait 100 years, or even 10 or 5 years, for a discovery to become something useful. It was most important to drive that lesson home in connection with the celebration of Faraday's discovery. Faraday had discovered benzene in the course of investigating what he supposed we should term a side issue, and it was some years before benzene as such was isolated in any quantity. It was only when a material was found in large quantity, and when regular supplies of it could be ensured, that it became of real importance to industry. Therefore, the academic chemist must have patience and sympathy with those of his brethren who were engaged in the important but more humdrum occupation of taking the original discovery and turning it on to a practical scale. As an instance of the great importance of discovery itself, however, he referred to Faraday's discovery of benzene, and the part it had played in the development of the industrial arts.

PROFESSOR H. E. ARMSTRONG, proposing the toast of "Our Court of Assistants," said he was speaking of all who had assisted in the work of arranging the celebrations. The toast was responded to by Mons. Paul Kestner, Professor Cohen, Professor Katayama, Mr. Milne Watson (Chairman of the Association of British Chemical Manufacturers and of the Benzol Association), and Lord Blanesburgh.

SIR JAMES CRICHTON-BROWNE (Treasurer, Royal Institution) proposed the toast of "The President," which was briefly acknowledged.

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### British Optical Glass

MR. F. TWYMAN, managing director of Adam Hilger, Ltd., writes to *The Times*: "Readers of the letter on British optical glass in your issue of May 18 (reproduced in THE CHEMICAL AGE of May 23) might erroneously suppose optical glass to be made in this country by Messrs. Chance alone. Parsons Optical Glass Co., Little Chester, under its then name of the Derby Crown Glass Co., began manufacture during the war, and I have found glass purchased from them since to be superior in many ways to any foreign glass I have tested. (I can say exactly the same of Chance's glass, whether purchased before the war or since.) Messrs. Barr and Stroud, of Glasgow, also now make glass. I have not personally tested any of it, but it must be very good to be suitable for the great rangefinders of which they are world-famous makers. The reason why before the war we had to buy optical glass abroad was that it was not then made in this country in all the required varieties. But soon after the war broke out Messrs. Chance greatly increased the number of varieties they made. Again, a strong impetus was given to the production of diverse glasses by Professor Herbert Jackson (now Sir Herbert Jackson, K.B.E., F.R.S.), who made and tested with his own hands many hundred different trial glasses. British optical glass is now available in ample variety, and we are unique among nations in possessing as many as three home sources of supply."

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### The Royal Society

AT the meeting of the Royal Society on Thursday, June 25th, at 4.30 p.m., papers to be read include:—"β-Ray Spectra of Thorium Disintegration Products," by D. H. Black, communicated by Sir Ernest Rutherford; "Tensile Tests of Crystals of an Aluminium Zinc Alloy," by C. F. Elam, communicated by Professor H. C. H. Carpenter; "On the Distribution of Intensity in the X-Ray Spectra of Certain Long-Chain Organic Compounds," by G. Shearer, communicated by Sir William Bragg; "The Mechanism of Catalytic Decomposition," by F. H. Constable, communicated by Sir William Pope; "Experimental Determination of the Thermal Conductivities of Gases," by H. Gregory and C. T. Archer, communicated by Professor H. L. Callendar; "The Ratio of the Specific Heats of Hydrogen," by J. R. Partington and A. B. Howe, communicated by Professor H. B. Dixon; "The Behaviour of Crystals and Lenses of Fats on the Surface of Water, Part I," by A. Cary and E. K. Rideal, communicated by Sir William Hardy; "The Capture and Loss of Electrons by α-Particles," by G. H. Henderson, communicated by Sir Ernest Rutherford.

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### Pushing British Goods

THE Federation of British Industries has been considering the possibilities of a publicity campaign to stimulate, at home and in the Dominions, the purchase of goods of United Kingdom origin; and the extent of unemployment is so serious that they will ask the Government to allocate funds for the purpose.

The Federation suggests the allocation of a definite fund sufficient to run an extensive advertisement and publicity campaign on a national scale for at least two years. The administration of this fund by a small committee on which should be represented: (1) the Government; (2) manufacturers; (3) labour; (4) newspapers; (5) one of the leading publicity experts.

The main basis of the campaign to be newspaper advertisement, supported by poster and similar publicity, supplemented, where opportunity offers, by other publicity methods, public meetings, broadcasting, films, social activities designed to promote the use of British goods, local shopping weeks and the like.

# Faraday as a Chemist

By Sir Wm. J. Pope, K.B.E., D.Sc., LL.D., F.R.S.

*The Faraday Benzene Centenary celebrations on Tuesday were preceded on Friday, June 12, by a commemorative lecture on "Faraday as a Chemist," by Sir Wm. J. Pope. From this "Friday evening discourse," into which all the salient features of Faraday's life and work as a chemist are compressed, the following extracts are taken :*

MICHAEL FARADAY was born in 1791 as the son of a working blacksmith in London; during the distress of 1801, when corn rose to over £9 a quarter, his family received public relief, and one loaf of bread was allotted weekly to the nine-year-old child. His systematic education was rudimentary in character, for in his thirteenth year he became errand boy to a bookseller in the neighbourhood of Manchester Square, and was entrusted with the duty of distributing the Sunday newspapers. So lowly an introduction to life might seem to furnish but a slight foundation for a great scientific career. Yet Faraday became Director of the Laboratory of the Royal Institution in his thirty-fourth year, and succeeded Sir Humphry Davy in the Chair of Chemistry in 1827; on his death in 1867 he was mourned by practically every learned academy in the civilised world as one of the foremost of the great chemists and physicists of the first half of the nineteenth century.

### Early Days

Faraday was apprenticed as a bookbinder to his employer in 1805. Early in 1812 a customer of his master's shop enabled him to attend four of Sir Humphry Davy's lectures; he sat in the gallery just above the clock, and carefully elaborated his notes upon the experiments shown and the explanatory discourses. He got into contact with Davy, and on March 1, 1813, was appointed by the managers as assistant in the laboratory of the Royal Institution. Faraday's scientific career had commenced, but it had commenced in circumstances which would have discouraged any but the most intrepid. The first piece of work in which he was called upon to assist Davy consisted in experiments on the newly discovered nitrogen chloride; six weeks after he came to the Royal Institution he was writing to a friend describing the injuries from which he and his master were suffering by the premature explosion of this capricious substance. Although this frequency of bodily hurt must have been very disconcerting to an entire novice in chemical experiment, Faraday seems to have accepted it without demur or complaint, and as a necessary incident to the occupation which he had now definitely determined to adopt. In the autumn of 1813 Sir Humphry Davy left England for an extended tour through France, Italy and Switzerland, taking Faraday with him as assistant and amanuensis; this journey, which lasted about eighteen months, appears to have been the only occasion on which Faraday left England for any length of time. This lengthy journey, much of it in a country with which England was at war, must have been of inestimable benefit to Faraday; he acquired some acquaintance with the outside world. In May, 1815, Faraday recommenced work at the Royal Institution, and shortly afterwards took possession of living apartments in the building.

This period was one of extraordinary interest in connection with chemical science. The sound experimental work of the previous century had freed the natural philosopher from the mystical and metaphysical trammels imposed by the alchemists, and had just led, through the work of Lavoisier, to an appreciation of the fact that quantitative measurements of weights and volumes had become the basis of an imminent great development in chemistry. Shortly before Davy had overthrown Lavoisier's view that oxygen was the acid forming element, had shown that hydrogen chloride contains no oxygen, and had proved that "oxymuriatic acid" was an elementary substance which he called chlorine, he had displaced caustic soda and caustic potash from their position as elements and isolated from them the elementary metals sodium and potassium. Dalton had just enunciated the atomic theory and Avogadro had stated his famous hypothesis that equal volumes of gas contain the same number of molecules under similar conditions of temperature and pressure; both these fundamental statements of principle were destined to survive to the present day as logical deductions from experimental observation. The next few years were to see the popularising of chemical science by the introduction of Davy's safety lamp for use in coal mines, an invention which was probably greater than any other asset in determining the increasing industrial activities of this country.

This was the atmosphere in which Faraday found himself when he made his permanent home at the Royal Institution in 1815; his publications of the succeeding few years show that he occupied himself busily in expanding his knowledge of science and in developing his remarkable talents as an experimenter.

In reviewing Faraday's earlier work as a chemist, the lecturer mentioned his investigation of the alloys of steel in conjunction with James Stodart; this had for its object the improvement of steel intended for the manufacture of cutting instruments, and the diminution of the tendency to rust. A large number of new alloys were prepared and studied; some, such as those with platinum, had little tendency to rust, those with rhodium could be forged and tempered, and the silver-steel alloys were used for some time for the manufacture of such articles as fenders. Although Faraday occasionally presented his friends with razors forged from certain of his new alloys, the work found no considerable technical applications; the modern extensive use of nickel-steel and chromium-steel, both of which Faraday prepared, suggests that the work was in advance of the needs of the times. Another branch of work surveyed was the liquefaction of gases.

### Discovery of Benzene

We now arrive, Sir William proceeded, at the moment of that important discovery which laid the foundation of more than one-half of modern organic chemistry and of one of the most important branches of chemical industry; this was the discovery of benzene, which was announced to the Royal Society on June 16, 1825.

Early in the last century the Portable Gas Co. was engaged in making illuminating gas by dropping whale or cod oil into a furnace maintained at a red heat; the inflammable gas produced by this process of destructive distillation was subjected to a pressure of about thirty atmospheres and stored in portable vessels. These latter were then transported to private houses and other buildings, and the gaseous contents burnt for illuminating purposes. During the process of compression a liquid was deposited, each 1,000 cubic feet of gas yielding nearly a gallon of this oil. Faraday subjected this condensed liquid to careful examination and separated from it a compound of carbon and hydrogen which he termed bicarburet of hydrogen; he made a detailed study of this substance, and the analytical results which he obtained, translated into the modern nomenclature, give its molecular composition as $C_6H_6$.

The memoir in which Faraday describes the isolation of this hydrocarbon is written in very simple language, but it reveals throughout the handiwork of a genius in experimentation and of an unrivalled master in the interpretation of experimental results. Thus, at this early date, and with the very modest appliances at his hand, the experimenter separated benzene in a state of purity from a very complex mixture; he found that it solidified on cooling, and gave its melting point as 5·5° C., the correct melting point being 5·44°. He determined the composition of the hydrocarbon by a method so ingenious that it might well tax the skill of the modern worker. He evaporated the hydrocarbon into a known volume of oxygen, noted the increase in gaseous volume, exploded the mixture in the eudiometer, and noted the diminution in volume, then treated with caustic potash solution, and observed the further diminution in volume due to the removal of the carbon dioxide. The data thus obtained give the proportion of carbon to hydrogen, and also the density of benzene vapour as compared with hydrogen as the standard; Faraday hence calculated the vapour density as 39, which is the correct value.

This exhibition of real mathematical power as a mode of unravelling a complicated skein of quantitative data was followed by a profound study of the chemical behaviour of

the new substance. Faraday noted that chlorine is without action on benzene in the absence of sunlight, but that when the mixture is exposed to sunlight vigorous action occurs with evolution of hydrogen chloride; he succeeded in separating the solid chlorination product, obviously *p*-dichlorobenzene, from the liquid residue containing the *o*-isomeride. This was the first occasion on which the catalytic activity of sunlight in promoting the action of halogens on the aromatic hydrocarbons had been observed, and it is perhaps superfluous to remark that this particular aspect of catalytic activity is still growing in importance, and is still a subject for scientific study. Many other points in this memoir of Faraday's might well call for distinction, but it will suffice to recall the comment passed upon the paper by Berzelius: "One of the most important chemical investigations which has enriched chemistry during 1825 is without doubt that of Faraday on the oily compounds of carbon and hydrogen obtained by compressing the gases obtained by the decomposition of fatty oils." The great Swedish chemist, himself the intellectual giant of the quantitative chemistry of his day, was impressed less by the new facts recorded than by the consummate art exercised in their elucidation, and by the conviction that a new epoch had dawned in organic chemistry.

The bicarburet of hydrogen which Faraday separated from the gas obtained by the destructive heating of an animal oil was prepared by an entirely different means some ten years later; Mitscherlich obtained it in 1834 by distilling benzoic acid with lime, and proposed to give it the name benzin because of its relation to benzoic acid, which in turn derived its name from its original source, gum benzoin; Liebig objected to this name and proposed that it should be named benzol. Liebig's statement, made in 1834, that benzol could be obtained from coal, is possibly based on a misreading of Faraday's paper in which he states that he had not been able to obtain it from coal-tar. The presence of benzol in coal-tar seems to have been first noted by John Leigh in 1824, and this observation was confirmed by Hofmann in 1845; in 1849 Mansfield was manufacturing benzol on a factory scale from coal-tar, and indeed lost his life in 1856 as the result of a fire which occurred whilst he was preparing the compound. The name benzol still survives as descriptive of the technical product, but the chemical name of the substance has now become benzene.

### A Great Starting Point

Benzene is the first member of a long series of compounds of carbon and hydrogen, the so-called aromatic hydrocarbons, which are closely related in chemical constitution and chemical behaviour. The second member of the series is toluene, $C_7H_8$, which was discovered by Pelletier and Walter in 1837, and is also separated in large quantities from coal-tar. Before discussing the modern importance of this particular series of aroma ic hydrocarbons, it may be well to refer to others with which Faraday was closely associated.

The hydrocarbon naphthalene was observed as a crystalline deposit in an apparatus used by Garden in 1819 for the distillation of coal-tar; its separation from coal-tar was described by John Kidd, the Professor of Chemistry at Oxford, in January, 1820. The chemical composition of naphthalene was determined by Faraday early in 1826; Faraday prepared the two isomeric derivatives now known as the naphthalene α- and β-sulphonic acids, and contributed further particulars concerning the behaviour of this hydrocarbon. The interest aroused in the components of coal-tar by Faraday's remarkable work on benzene and naphthalene led to a rapid increase in our knowledge of the composition of this raw material; in 1832, Dumas and Laurent separated anthracene from it, and, up to the present time, some thirty aromatic hydrocarbons and more than that number of other aromatic compounds have been extracted from this product of the distillation of coal.

### Industrial Developments

It is worth while, if merely as an object lesson exhibiting the vast influence which can be exerted on the world's affairs by some originally modest piece of scientific research, to consider the scope and magnitude of the progress made as a result of Faraday's discovery of benzene one hundred years ago.

The whole of the great coal-tar colour industry sprang from Faraday's study of coal-tar; in 1856 the late Sir W. H. Perkin made the first coal-tar colour, Perkins' mauve, from coal-tar benzene, and at the great Exhibition of 1862 a large number of such artificial colouring matters were displayed. The number of coal-tar colours now recognised as of technical value is of the order of 1,200. Whilst the earlier artificial dyestuffs, although brilliant in colour, were often fugitive to light or to washing, we are now in possession of coal-tar colours which are more fast to light and to washing than indigo, madder, or any of the stable dyestuffs known to our ancestors. Many of the newer aromatic artificial dyes persist even when the fabric on which they are deposited has rotted away.

Whilst the manufacture of coal-tar dyes grew to vast dimensions owing to wise development and exploitation, other industries and fields of knowledge also benefited. In course of time it was found that Faraday's benzene was the starting material for many aromatic substances of use in medicine, in photography, and in many other arts. Furthermore, the coal-tar hydrocarbons, benzene and toluene, are the raw materials from which the high explosives, picric acid and trinitrotoluene, are manufactured. At the outbreak of the recent war, no picric acid was being made from benzene, and no trinitrotoluene had ever been made on a large scale in this country. This was of course well realised on the Continent; to what extent the known unpreparedness of Great Britain for the manufacture of the staple high explosives was a factor in precipitating war cannot now be ascertained.

The set of great industries involved in the manufacture of artificial dyestuffs, pharmaceutical products, and military and naval high explosives are thus closely allied; Faraday's discovery of benzene and its analogues is also important in connection with the liquid fuel used in the ordinary internal combustion engine. Certain of the naturally occurring petroleums contain large proportions of aromatic hydrocarbons, such as benzene, and the fact that a petroleum from Borneo containing about 20 per cent. of benzene and toluene was available in 1914 was a very material relief to the difficult situation created by the impossibility of immediately preparing large quantities of raw materials for the manufacture from coal-tar of high explosives. Benzene and toluene from coal-tar are now largely used for blending with petrol from overseas, and for improving its efficiency as a fuel.

It would be a mistake to attempt to measure the achievements of Faraday on a scale derived from a consideration of the immediate material benefits to the world which have accrued from his work. Probably no man, with the possible exception of Newton, has ever exercised throughout a century such a persistent directive impulse to the activities of a huge body of scientific workers. This is the more strange in that Faraday was essentially a solitary worker; the long list of his published papers includes but two in which he is named as a joint author. It would almost seem that the man was endowed with such consummate skill as an experimenter that any collaborator of his day would have impeded the progress of a joint investigation.

To the chemist, the discussion, applications, and extension of Faraday's electrochemical conceptions have been a fruitful source of inspiration and progress for nearly a century; as time passes on those conceptions are seen to increase continually in fundamental significance. It cannot be doubted that when the second centenary of the discovery of benzene is honoured in this theatre a hundred years hence my successor will be able to point to consequences, still more fundamental and far-reaching, of the work and thought of perhaps the greatest experimental genius the world has ever seen.

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### Faraday Exhibit

A SMALL but interesting exhibition is on view at the Science Museum, South Kensington, commemorating the centenary of the discovery of benzene. There are two original specimens of benzene, prepared and labelled by Faraday, which were bequeathed to the Museum in 1911 by Mr. H. L. Barnard (Faraday married Sarah Barnard), and an autographed photograph of himself which was bequeathed to the Museum by Miss Jane Barnard. The original cabinet in which Faraday stored the specimens of benzene, and which contains many other specimens of his chemical discoveries, including the polished weldings of steel and platinum and the alloys produced with Mr. Stodart in 1821 in the search for a non-rusting steel, is also on view.

# Sir Max Muspratt on Germany

## Only Hampered by Shortage of Capital

SIR MAX MUSPRATT, chairman of the United Alkali Co., has just returned from a short visit to Germany, his first since the war, and in an interview with the *Liverpool Post* he gives some of his impressions of the country, mainly as regards economic conditions.

"I visited (he said) Cassel, the headquarters of the potash industry; Frankfurt, a great commercial and industrial city; Mannheim, which is almost wholly industrial; and Heidelburg, the famous university centre. Any impressions I received are, of course, superficial, owing to the shortness of my visit; but I never missed an opportunity of talking to people and observing what was going on.

### Labour Conditions

"From all accounts the manual workers are working well. Their wages are admittedly too low, and it is only the extraordinary patience of the German character that makes it possible for such wages to be paid. The shortage of houses is extremely acute and drastic steps are being taken to deal with the matter. Owing to the restriction of rent before the stabilisation of the mark, rents have been practically nominal; but at an early date an Act will come into force under which rents may be charged up to 60 per cent. above pre-war value, calculated in the renten mark. Of this, however, 25 per cent. will be taken by the Government and immediately spent in erecting new houses. Some of the larger companies are building houses for their workpeople, but the shortage of capital limits such enterprise. The increased rent will force wages up and will thus place German competition on a more reasonable level."

*[Block by courtesy of "The Liverpool Daily Post."*

A GROUP TAKEN AT THE OPENING OF THE UNITED ALKALI CO.'S NEW RECREATION GROUND.
*Left to right:* MRS. HORACE MUSPRATT, THE MAYOR AND MAYORESS OF WIDNES, SIR MAX MUSPRATT, AND MR. STUART.

"I found that a complete change had come over Germany, as compared with 25 years ago, when I knew it best, and in the days before the war, when the military spirit was predominant. The Germans of to-day are subdued but quite self-respecting, civil without being servile, and quiet instead of noisy. They are undoubtedly working really hard, and their industrial organisation is probably the best in the world. They are so absolutely thorough. Every point, scientific and economic, is thought out, and they go steadily ahead, adapting themselves to whatever conditions exist, in either the home or the foreign market, particularly the former."

Asked if they were making substantial progress, Sir Max said: "Oh, yes. Their one drawback at present is a real shortage of working capital. That makes them far less aggressive in the world market than they otherwise would be. Their ideal, undoubtedly, is to resuscitate Germany first, but, at the same time, they are striving to get a share of the world market wherever they can economically do so.

### Potash Industry Flourishing

"With regard to trade generally," remarked Sir Max, "Germany is suffering from the same temporary depression as we are; and that has been accentuated in the last few days by the financial difficulties of the Stinnes group. The position of coal is extremely bad, owing probably to the great economies in fuel consumption made possible in recent years by improved plant, and also of the greater use of lignite, and to the use of oil for the propulsion of ships. Some big lignite installations have affected the coal mines very much. The two 'bright spots' are the potash industry, which is doing remarkably well, especially in exports, and the crops, which are very promising. The weather has been favourable to grains and vines, and the German farmers are working with great energy. Good crops will give a spurt to industry and trade a little later on.

"The general health of the people seems to be good. It is true that young people between fourteen and eighteen show

distinct signs of malnutrition during childhood. On the other hand, they are taking exercise to a far greater degree than the youth of Germany used to do. Rugby football has developed largely. The final for the whole of Germany was played at Frankfurt last Sunday. I did not attend, but I understand that some 40,000 people were present. On the same day the Taunus Forest, through which I motored, was full of young people taking really serious walks. The Saturday afternoon holiday has been introduced as far as possible. This innovation is very much appreciated by the workers of all ranks, who now found themselves very much fresher and more efficient on Monday mornings than they used to be when they worked till eight and nine o'clock on Saturdays evenings. I do not think this curtailment of hours will add anything to the cost of German production.

"As to the people's spending power, I saw but few motor-cars, large or small, in Frankfurt, but there was a fair number of motor-bicycles and an enormous number of push bicycles. On the railways there were very few first-class carriages, and all of them were practically empty. The fourth-class compartments were so overcrowded that many thirds had to be labelled 'fourth.' Generally speaking, the people are spending as little as possible, but they are adequately dressed, and are certainly not starving."

## United Alkali New Sports Ground

### The Personal Touch in Industry

On Saturday, June 13, at Widnes, the handsome pavilion of the United Alkali Co. was opened by Sir Max Muspratt. Employees from the numerous works have entered with the same zest as the employers into the project, and up to the present over 2,300 workpeople have signed on as members, with a number of associates. The grounds cover 26 acres, with bowling greens, hard and grass tennis courts, and pitches, for cricket, football, and hockey.

Sir Max was accompanied by the members of the board of directors and staff, including Dr. G. C. Clayton, M.P., and Mr. and Mrs. Horace Muspratt, Dr. Conroy, Mr. T. W. Stuart (general technical manager), Captain and Mrs. Bain, Mr. D. Downey, Mr. G. Martin, Mr. and Mrs. R. H. Davidson, Mr. and Mrs. G. E. James, Mr. T. Whinyates, and Mr. and Mrs. Kendrick. There were also present works managers of the industrial concerns in the town, and the Mayor and members of the corporation.

Mr. W. H. Smith outlined the scheme, and said that it was purely voluntary and sufficiently attractive for every employee to join. The pavilion was the club's most valuable asset, because the social side was what they wanted to encourage. The programme of sports appointed for that day was based upon the best social understanding whereby a workman would be able to participate with his employer in the games.

### Creating Better Understanding

Sir Max Muspratt, who was accorded a hearty welcome, said that that day they were making another milestone in progress in which the industry had played so great a part. They were proud of the industry and proud of the company, but what they wanted to do was to turn that pride into appreciation and realisation. It was not altogether the industry that mattered, but the men and women who took part in the building of it from day to day and week to week. The club was the outward and visible sign of this. The time had now come when the personal touch mattered more than machinery. In the club they met upon the common footing of humanity, sport and social welfare, and it was in that spirit that he had the greatest pleasure in declaring it open.

Dr. Clayton viewed the undertaking as a great move towards a better understanding between employer and employee. He was a great admirer of team work, because no man could play for himself alone.

Mr. Stuart, who has just completed fifty years of activity in the chemical trade, said the beautiful ground would raise the standard of sport, for which Widnes had always been famous. It would also have the effect of increasing the good-fellowship amongst them all—a desire which everyone cherished.

Mr. Daniel Garghan, the Mayor, said that when he looked round the magnificent structure he could not help thinking of the great change that had taken place in the Alkali management. Forty-five years ago, when he entered the works, the twelve-hours' shift was in vogue. Now the men had the eight-hour shift, with plenty of time for leisure and with fine playing fields provided.

In a subsequent bowling match, Mr. J. H. Smith and Mr. T. Spencer beat Dr. Clayton and Mr. L. Bennett 15 to 12, Mr. T. Sadler beat Mr. P. Queen 400 to 361 in the billiards match, and in the cricket match the captain's team scored 91 to the secretary's team's two innings of 12 and 74.

## British Association of Chemists

### The Overcrowding of the Profession

From some interesting but disquieting figures which have been collected by the Verein Deutscher Chemiker it appears that the chemical profession in Germany has been greatly overcrowded since the war, and this German Association advocates a reduction of one-third of the number of students trained. There is, of course, no country in the world where the need for industrial chemistry is so clearly recognised, and the demand for chemists, therefore, so great; but these recommendations are regarded by the Association in question as vitally necessary to the welfare of the profession in Germany.

No figures appear to be available in England, but there is more than sufficient evidence to show that in this country conditions are very little, if at all, better. In addition, the demand for chemists is smaller, and it is improbable that the demand will rapidly increase. Indeed, the evidence at our disposal encourages the view that at present the tendency is towards a decrease. Germany, whose industries are rapidly being reorganised, will, on the other hand, probably increase her demand.

The conditions in this country must, therefore, be regarded as extremely serious, and it is an obvious duty to warn those who may entertain thoughts of entering the profession that its state of congestion is at present such as to place success, and perhaps even livelihood, in jeopardy.

A congested profession is from every point of view a serious catastrophe, and the British Association of Chemists has no sympathy with the one argument sometimes raised in its favour. It is asserted that keen competition brings the most efficient to the top, and that industry is thus benefited. This is to some extent true, but the most efficient do not long remain the most efficient if they are inadequately paid—and inevitable consequence of keen competition. There is no other view in favour of an overcrowded profession that can for a moment be entertained.

In England, however, the situation is aggravated by a condition which, we believe, does not maintain in Germany. However the matter may stand in law abroad, in practice, entry to the profession of chemistry is in some way restricted, while in England restriction there is none. In Germany, therefore, entry into the profession is to some extent automatically regulated, whereas in England there is no control at all upon the numbers who may compete in the market. This is the most serious aspect of the question, and in our view the possibility in some way of regulating entry into the profession ought to be explored. Registration would automatically stem the tide from one direction, and to attempt this is better than to make no move at all.

The difficulties in connection with any scheme of registration are undoubtedly formidable, but, having regard to the state of affairs, all who have at heart the welfare of the profession ought to give them serious consideration. The Association regards the question as one of the first importance, and is endeavouring, with some measure of success, to mould opinion in this direction.

The Association, therefore, appeals to all those who contemplate the practice of chemistry as a career to consider well before they enter upon it. The supply of chemists enormously exceeds the demand, and there seems little probability of this situation becoming easier in the near future. To those who are already in practice it appeals, asking them to give serious consideration to a position that is serious in the extreme. It is necessary that some steps should immediately be taken, and an increased membership of the Association would greatly strengthen its hands.

H. T. F. R.

# Chemical Trade Returns for May

## Exports Increase and Imports Decrease against Last Month's Figures

IMPORTS of chemicals, drugs, dyes, and colours for May totalled £1,061,459. This represents a decrease of £410,227 as compared with last year, and a decrease of £252,962 as compared with April. The exports are valued at £2,058,790—a decrease of £363,515 over last year, but an increase of £180,862 on April s figures.

In the imports marked increases are noted in the case of unspecified painters' colours and distilled glycerin, and the most important decreases are recorded in the case of bleaching materials, crude glycerin, saltpetre, potassium compounds, sodium nitrate—the last-named standing at less than a third of the figure for last year.

On the export side the varying market for sulphate of ammonia deserves attention. Spain has increased her imports, but the majority of the markets have dropped, giving a slightly reduced aggregate. Bleaching powder shows a considerable increase, also crude glycerin. There is a remarkable drop in the results shown for benzol and toluol, and naphtha. Naphthalene, tar and creosote oil, distilled glycerin, sodium carbonate and chromate are also decidedly down.

### Imports

| | Quantities. Month ending May 31, 1924. | Quantities. Month ending May 31, 1925. | Value. Month ending May 31, 1924. £ | Value. Month ending May 31, 1925. £ |
|---|---|---|---|---|
| CHEMICAL MANUFACTURES AND PRODUCTS— | | | | |
| Acid Acetic .....tons | 776 | 621 | 38,781 | 27,641 |
| Acid tartaric.....cwt. | 4,418 | 4,176 | 23,479 | 20,495 |
| Bleaching materials.. ,, | 12,296 | 5,535 | 9,426 | 7,107 |
| Borax..... ,, | 9,707 | 7,043 | 11,582 | 8,283 |
| Calcium carbide .... ,, | 34,910 | 40,739 | 22,476 | 27,753 |
| Coal tar products.. value | — | — | 114,162 | 59,233 |
| Glycerin, crude.....cwt. | 5,304 | 101 | 13,644 | 300 |
| Distilled..... ,, | 95 | 322 | 424 | 1,324 |
| Red lead and Orange lead ..... ,, | 3,396 | 2,847 | 6,535 | 6,038 |
| Nickel oxide ..... ,, | 2,225 | 2,225 | 11,431 | 11,502 |
| Potassium nitrate (saltpetre) .... ,, | 12,185 | 1,392 | 14,609 | 1,866 |
| All other potassium compounds .....cwt. | 343,442 | 221,588 | 58,947 | 52,471 |
| Sodium nitrate ..... ,, | 256,662 | 73,018 | 168,718 | 46,652 |
| All other sodium compounds .....cwt. | 32,733 | 22,928 | 31,101 | 18,492 |
| Tartar, Cream of .... ,, | 5,553 | 3,819 | 21,024 | 14,298 |
| Zinc Oxide.....tons | 1,083 | 800 | 38,940 | 27,477 |
| All other sorts....value | — | — | 247,005 | 258,109 |
| DYES AND DYESTUFFS— | | | | |
| Intermediate Coal Tar products .....cwt. | 60 | 101 | 923 | 1,313 |
| Alizarine ..... ,, | 1,440 | 29 | 13,748 | 1,008 |
| Indigo, synthetic ... ,, | — | — | — | — |
| Indigo, natural .... ,, | 67 | — | 2,313 | — |
| Other sorts ..... ,, | 4,349 | 1,568 | 103,439 | 38,909 |
| Cutch ..... ,, | 8,477 | 5,584 | 13,739 | 11,167 |
| All other extracts .. ,, | 5,463 | 5,060 | 20,898 | 15,926 |
| Extracts for tanning ,, | 117,234 | 105,959 | 113,076 | 102,651 |
| Barytes, ground, including, blanc fixe ... cwt. | 106,598 | 69,196 | 25,413 | 15,993 |
| White lead (dry) ... ,, | 15,348 | 8,254 | 29,170 | 16,679 |
| All other painters' colours ..... ,, | 81,267 | 115,692 | 120,571 | 119,965 |
| Mercury.....lb. | 350,890 | 82,564 | 59,698 | 13,153 |
| Total of chemicals, drugs, dyes and colours ..... value | — | — | 1,531,384 | 1,074,612 |

### Exports

| | Quantities. Month ended May 31, 1924. | Quantities. Month ended May 31, 1925. | Value. Month ended May 31, 1924. £ | Value. Month ended May 31, 1925. £ |
|---|---|---|---|---|
| CHEMICALS, DRUGS, DYES AND COLOURS— | | | | |
| Acid sulphuric ..... cwt. | 2,243 | 2,491 | 3,665 | 3,108 |
| Acid tartaric ..... ,, | 914 | 637 | 5,393 | 3,623 |
| Ammonium chloride (muriate) ..... tons | 446 | 243 | 14,902 | 7,764 |
| Ammonium sulphate— | | | | |
| To France..... ,, | 703 | 526 | 9,152 | 6,996 |
| ,, Spain and Canaries tons | 6,656 | 10,111 | 89,377 | 130,982 |
| ,, Italy ..... ,, | 673 | 464 | 9,451 | 6,094 |
| ,, Dutch East Indies tons | 1,350 | 167 | 19,261 | 2,232 |
| ,, Japan ..... ,, | 3,450 | 500 | 47,985 | 6,250 |
| ,, British West India Islands (including Bahamas) and British Guiana tons | 2,512 | 2,076 | 35,391 | 27,544 |
| ,, Other countries ,, | 2,775 | 1,568 | 39,627 | 21,030 |
| Total ..... ,, | 18,119 | 15,412 | 250,244 | 201,228 |
| BLEACHING POWDER .. cwt. | 21,210 | 31,828 | 11,560 | 16,644 |
| Anthracene ..... ,, | 590 | 2,869 | 388 | 1,344 |
| Benzol and toluol ..galls. | 287,800 | 1,859 | 14,238 | 227 |
| Carbolic acid..... cwt. | 9,217 | 8,368 | 18,297 | 13,750 |
| Naphtha.....galls. | 38,312 | 6,588 | 3,187 | 635 |
| Naphthalene ..... cwt. | 3,831 | 1,147 | 2,973 | 750 |
| Tar oil, creosote oil, etc. .....galls. | 5,163,983 | 4,217,855 | 205,782 | 134,719 |
| Other sorts.....cwt. | 47,562 | 26,195 | 24,520 | 18,084 |
| Total....value | — | — | 269,385 | 169,509 |
| COPPER, sulphate of...tons | 5,631 | 7,097 | 136,679 | 163,071 |
| DISINFECTANTS, INSECTICIDES, ETC. ..... cwt. | 42,778 | 39,728 | 97,288 | 94,716 |
| Glycerin, crude..... cwt. | 2,617 | 3,664 | 6,977 | 10,451 |
| Glycerin, distilled ... ,, | 14,087 | 4,126 | 54,613 | 16,171 |
| Total ..... ,, | 16,704 | 7,790 | 61,590 | 26,622 |
| Potassium chromate and bi-chromate ..... cwt. | 3,254 | 2,000 | 7,877 | 4,062 |
| Potassium nitrate (saltpetre) ..... ,, | 1,270 | 1,051 | 2,558 | 2,242 |
| All other sorts ..... ,, | 3,306 | 2,478 | 24,087 | 12,727 |
| Total ..... ,, | 7,830 | 5,529 | 34,522 | 19,031 |
| Sodium carbonate .... cwt. | 698,948 | 440,165 | 167,926 | 118,345 |
| Sodium caustic ..... ,, | 192,396 | 128,439 | 153,386 | 105,110 |
| Sodium chromate and bi-chromate ..... ,, | 6,142 | 3,242 | 11,976 | 5,580 |
| Sodium sulphate, including salt cake ..... ,, | 129,786 | 128,669 | 29,684 | 19,169 |
| All other sorts ..... ,, | 72,906 | 50,568 | 105,028 | 70,145 |
| Total ..... ,, | 1,100,214 | 751,083 | 468,000 | 318,349 |
| Zinc oxide ..... tons | 424 | 116 | 13,999 | 4,991 |
| Chemical manufactures, etc., all other sorts value | — | — | 328,903 | 322,646 |
| Total of chemical manufactures and products (other than drugs and dyestuffs) ..... ,, | — | — | 1,696,130 | 1,351,302 |
| DYES AND DYESTUFFS— | | | | |
| Products of coal tar cwt. | 10,707 | 9,289 | 81,324 | 70,665 |
| Other sorts ..... ,, | 5,110 | 3,521 | 6,616 | 6,626 |
| Total ..... ,, | 15,817 | 12,810 | 87,940 | 77,291 |
| PAINTERS' COLOURS AND MATERIALS not elsewhere specified— | | | | |
| Barytes, ground, including blanc fixe cwt. | 7,701 | 9,195 | 3,995 | 3,875 |
| White lead (dry).... ,, | 15,136 | 12,342 | 35,940 | 29,175 |
| Paints and colours ground in oil or water ..... ,, | 34,842 | 40,232 | 82,640 | 92,904 |
| Paints and enamels prepared (including ready mixed) .... ,, | 34,065 | 33,049 | 115,301 | 110,321 |
| All other sorts ..... ,, | 59,082 | 61,861 | 121,997 | 120,987 |
| Total ..... ,, | 150,826 | 156,679 | 359,873 | 357,262 |
| Total of Chemicals, drugs, dyes and colours ..... value | — | — | 2,422,314 | 2,058,799 |

## Indian Chemical Notes

[From Our Indian Correspondent.]

The attempts to start chemical industries in India are proceeding on a small scale. Though India's resources are large, there are a number of impediments, the most important of which is the lack of trained men. Further, the works that are already in existence do not all show good progress. There are about 16 chemical works in India manufacturing varied kinds of chemicals. Some are progressing well, some do not. Last year especially was not a good one, owing to great depression.

The result of this depression is seen in the working of the works existing in Baroda and Bombay. About two years ago the Dharamsi Morarji Chemical Co., Ltd., was started in Bombay under able management and the works are equipped on quite modern lines. The capital of the company is one crore of rupees. The last year's working of the company has resulted in a loss of Rs. 3 lakhs. Of course during the year a lot of construction work was in progress, on account of which full volume of work could not be obtained. But the current year promises to be hopeful. Additional plants have been erected and put into operation for copper phosphates, bone meal, superphosphate, phosphoric acid, and chemically pure and B.P. acids. The plants for the manufacture of aluminous salts have also been extended for greater output. The acids and chemicals manufactured in these works have stood the test of the Government Test House Laboratory at Alipore very well, and these have been certified to be of the approved standard.

The Modern Chemical Works, Baroda, is not now able to make both ends meet. Working capital was provided last year, and the works continued to manufacture sulphuric and other allied acids, and it is thought that the removal of the heavy import duty on sulphur would afford the concern an opportunity to work on a profitable basis.

The Dwarka Cement Company, of which the authorised capital is Rs. 50 lakhs, manufactured during the last year 25,400 tons of cement. The factory is not as yet working to its full capacity, and though prospects for cement industry are very bright, the company is not able to run the factory industry on a profit-earning basis. S. G. W.

### Gas and Fuel Research at Leeds

Professor J. W. Cobb, head of the Department of Coal Gas and Fuel Industries at Leeds University, has given details of the work done, to the Press. A report of interest was that concerned with the work of the Gas Research Fellow, Mr. C. B. Marson. This dealt with the changes which are brought about in the structure of coke by the presence or absence of certain constituents in the coal ash. Oxide of iron and soda were found to be of great importance, and to modify very materially the structure of the coke in the sense of making it much more finely porous and stronger. Another co-operative research was that into the subject of increased economy and efficiency in the production of motor spirit. This was carried out by Mr. W. H. Hoffert, assisted by Mr. Claxton, under the auspices of the Joint Benzole Research Committee of the University of Leeds and the National Benzole Association, and it dealt more especially with the comparative behaviour of the new solid absorbents which are being tried for the extraction of benzole motor spirit from coke oven and town's gas.

### A Question of War-Time Shipments

On Friday, June 12, the Court of Appeal, consisting of Lord Justices Bankes, Scrutton and Sargant, had before them an appeal by Andrew Weir and Co., merchants, of London and Scotland, from a judgment of Mr. Justice Finlay in favour of the Controller of the Clearing Office for £15,540 7s. 9d. as interest alleged to be due under a contract for the purchase of a quantity of nitrate of soda from the German firm of Salpeterwerke, Gildemeister Aktien-gesellschaft, of Bremen, in 1914. The defendants, having paid the principal, denied that there was any interest due.

The English and German Clearing Offices took the view that interest was payable on the ground that there was a paragraph in the Peace Treaty providing that interest should be payable in the circumstances. In the Peace Treaty, said counsel, interest was not payable on pecuniary obligations unless it was a debt within the meaning of the Peace Treaty. Appellants' case was that there was no debt, and therefore no obligation to pay interest, and that attitude they had adopted consistently from the start.

The Court reserved its judgment.

### Spanish Olive Oil Regulations

A recent Royal Decree lays down regulations respecting the export of olive oil, the import of oilseeds and the sale, etc., of vegetable oils. The export from Spain of olive oil in glass or tin containers bearing a registered Spanish trade mark is to be free of any export tax and of the transport tax in the case of high seas traffic. Olive oil exported in hogsheads, casks, wooden barrels, iron cans, or any receptacle other than those mentioned above, is to be free of export tax provided that the receptacles display clearly registered Spanish trade marks. Olive oil packed in receptacles which do not bear registered Spanish trade marks may be subjected to an export duty when the Government considers such taxation advisable.

The above provisions were to come into force on June 1. Consignments of oilseeds which were awaiting unloading, were *en route* for Spain, or were loaded on board ship under Consular visa before May 19 will not, however, be included in the restricted quantity of oilseeds which is allowed to be imported. This quantity is to be calculated from January 1 to December 31, the amount fixed in respect of the months June to December of this year being 23,400 metric tons.

The Council of National Economy is to examine the Customs duties to be applied at the next revision of the Customs Tariff to oilseeds covered by Tariff No. 999 in relation to the duties on oils falling under Tariff No. 801 (non-siccative liquid vegetable oils); and these tariff Nos. are to be subdivided so as to distinguish between natural and manufactured products, and the duties are to be fixed so as to provide protection for Spanish oilseed growers and oil manufacturers.

### A Trade Name Dispute

On Friday, June 12, in the Chancery Division, Mr. Justice Russell had before him the case of F. C. Calvert and Co., manufacturing chemists, of Bradford and Manchester, against Charles Latimer Calvert, trading as C. Calvert and Co., manufacturing chemists, of Guide Bridge. The plaintiffs sought an injunction to restrain the defendant from selling Lysol as being of the plaintiffs' manufacture. Mr. Howard Wright, for the defendant, said he was merely using his own name and acting without any malafides. Therefore it was not a gross case, as suggested by the plaintiffs.

Mr. Hurst, K.C., for plaintiffs, said they made carbolic acid preparations ranging from tooth powder to disinfectants, and the word "Calvert" was distinctive of their goods. The defendant started business in 1923, but plaintiffs had only just discovered that the defendant was selling Lysol under the name of Calvert. He also used the word "Manchester," whereas he traded at Guide Bridge.

Defendant gave an undertaking, until the trial of the action, not to sell or advertise either Lysol or any other carbolic preparation of Calvert's or any other description calculated to lead to the conclusion that it was prepared by the plaintiffs.

### Manure Manufacturers' Voluntary Liquidation

A meeting of the creditors of Birkett and Co., Ltd., chemical manure manufacturers, etc., Retford, Notts, was held recently, at Retford, when Mr. A. T. Winter, liquidator in the voluntary liquidation of the company, reported that the gross liabilities were £20,507 12s. 6d., of which £6,840 10s. 3d. was expected to rank. According to the books, assets totalled £12,482 12s. 10d., but were only estimated to realise £4,732 17s. 9d. From the latter figure had to be deducted £132 16s. 2d. for preferential claims, leaving net assets of £4,600 1s. 7d., or a deficiency of £2,240 8s. 8d., so far as the unsecured creditors were concerned.

It was stated that the dividend for the creditors depended entirely upon whether the business could be disposed of as a going concern, together with the freehold property. It was eventually decided to confirm the voluntary liquidation of the company, with Mr. Winter as liquidator. It was also resolved that the liquidator should continue the business for a short time with a view to finding a purchaser. An advisory committee of three of the creditors was nominated.

## "Pollopas"

### Commercial Possibilities of New Synthetic "Glass"

"POLLOPAS," the new glass-like synthetic resin, which is mainly the invention of Dr. Fritz Pollak, of Vienna, and which was referred to in THE CHEMICAL AGE of October 11, 1924, is now manufactured on a commercial scale at Vienna.

We understand that the initial output will be about 200 kilogrammes per day in the form of sheets, etc. The latest and improved product is to be known as "Pollopas F.F.," and the main constituents are urea ($CH_4N_2O$) and formaldehyde. The improved product may have great possibilities because of its insulating properties. It is claimed to have the elastic properties of rubber, and has been found by experiment to be 66 per cent. more elastic than celluloid, which suggests that "Pollopas" will have possibilities as an inflammable substitute for that substance. It is said to be more clear than glass, and the suggestion put forward that it will make an effective and unbreakable substitute for porcelain prompts comparison with the colourless synthetic resin produced by British Cyanides Co., Ltd., and at present being handled by their subsidiary company, the Beetle Products Co., Ltd. (see THE CHEMICAL AGE, June 6). "Pollopas" has an advantage over glass in that it can be dyed with aniline dyes, whereas the natural product requires the use of the very limited mineral colours.

In its application to photography mention has been made of the fact that the ultra-violet rays pass much more easily through it than through glass. It is much lighter than glass, with a specific gravity of 2·85, as against 3·5 for flint glass.

We hope to give further information of the product in the near future.

## French Potash Production

THE Department of Overseas Trade learns from a Consular communication that a report issued by the Société Générale Alsacienne de Banque, Strasbourg, gives the following details of production of potash salts in the Haut Rhin potash mines during April 1924 and 1925 :—

| | 1924. | 1925. |
|---|---|---|
| | Metric tons. | |
| Sylvinite, 12-16 per cent. ..... | 22,400 | 20,000 |
| ,, 20-22 per cent. ..... | 28,000 | 38,000 |
| Chloride, 30-40 per cent. ..... | 5,300 | 4,500 |
| ,, 50 per cent. and over .. | 17,000 | 18,000 |
| Total of Salts ..... | 72,700 | 80,500 |
| Potash content ..... | 20,450 | 22,500 |

This makes the total figures of production since the beginning of the year: Potash salts (1924), 392,000; (1925), 384,000. Potash (1924), 96,300; (1925), 103,700. It also states that the Société Commerciale des Potasses d'Alsace has decided to maintain present prices for sales during the third quarter of 1925. For July it will grant dead-season bonuses of 2.25 francs the ton for sylvinite, 12-16, 3 francs for sylvinite 20-22, and 9 francs for chloride and sulphate of potash.

## Birmingham's Tar Products Revenue Down

BIRMINGHAM Corporation Gas Department, in recommending to the City Council an increase in the price of gas from 2s. 10d. per 1,000 cubic feet to 3s. 2d., explains that this action is largely due to the considerable fall in the value of tar products. The slump, noticeable a year ago, increased and had gone on without a break. The fall in revenue from tar during the year was nearly £70,000, notwithstanding a larger quantity produced in the year ending March, 1925. After taking into account the increased quantity of ammoniacal liquor made and sold during the year, the fall in value of this residual had resulted in a loss of revenue equal to £21,644. A reduction of 5s. per ton on coke had to be made recently owing to increasing stocks and general price reductions made by other undertakings. This reduction represented a loss of income of £100,000 per annum.

The returns were as follows: Coke and breeze (less labour and cartage), £555,357, compared with £501,906; tar, £164,411, against £233,431; ammoniacal liquor, £39,041, against £55,112; sundry residual products, £4,556, compared with £6,372; and sale of spent oxide, £11,332, against £13,823.

# Chemical Matters in Parliament

### Faversham Explosion Inquiry

Colonel Day (House of Commons, June 10) asked the Home Secretary whether, in view of the statement made by Lieut.-Colonel Thomas, as representing the Home Office, at the inquest on the three victims of the Faversham powder works explosion, he would at once cause full investigation and inquiry to be made at all works engaged in the manufacture and handling of explosives, with a view to discovering whether the full terms of the Home Office's licences were being carried out.

Sir W. Joynson-Hicks said that the hon. and gallant Member had supplied him with an alleged statement by the Government Inspector that some firms are rather lax in carrying out the terms of their licences. No such statement was made. Explosives factories were visited periodically by the Inspectors of Explosives for the purpose of seeing that the conditions of the licences and requirements of the Act are fully complied with. He was informed by the Chief Inspector that a high standard of compliance was maintained.

### Arms and Munition Exports

Mr. Samuel (House of Commons, June 11), in reply to Colonel Day, said that exports of arms, ammunition and military and naval stores amounted in the three years 1922–24 to £11,746,000 in value, but at least one-fifth of this amount was in respect of sporting guns and ammunition and explosives for industrial purposes.

### Sugar Beet and British Machinery

The Minister of Agriculture (House of Commons, June 15), in reply to questions, circulated the following table showing the total approximate commitments of beet sugar factories since the passing of the Act as regards plant and machinery :—

| Name of Company. | British. | Foreign. | Total. | Origin. |
|---|---|---|---|---|
| | £ | £ | £ | |
| Home Grown Sugar, Ltd., Kelham. | Nil | Nil | Nil | Built in 1921. |
| The English Beet Sugar Corporation, Ltd., Cantley.* | 12,000 | 7,000 | 19,000 | Built in 1911. Dutch and German. |
| The Anglo-Scottish Beet Sugar Corporation, Ltd., Colwick.* | 115,000 | 5,000 | 120,000 | Built in 1924. Belgian and German. |
| The Anglo-Scottish Beet Sugar Corporation, Ltd., Spalding. | 120,000 | 8,200 | 128,200 | From Germany and Belgium. |
| The West Midland Sugar Co., Ltd., Kidderminster. | 120,000 | 8,200 | 128,200 | |
| The Ely Beet Sugar Factory, Ltd., Ely. | 81,000 | 84,000 | 165,000 | Mainly Dutch with some German. |
| The Ipswich Beet Sugar Factory, Ltd., Ipswich. | 79,000 | 105,000 | 184,000 | |
| The United Sugar Co., Ltd., Bury St. Edmunds. | 114,000 | 34,500 | 148,500 | From Czechoslovakia. |
| The British Sugar Manufacturers, Ltd., Wissington. | 113,500 | 29,400 | 142,900 | |
| | 754,500 | 281,300 | 1,035,800 | |

* Plant for extensions.

### Boron in Food

Mr. Whiteley (House of Commons, June 15) asked the Minister of Health whether the new Regulations regarding preservatives in foodstuffs were based on evidence that anyone had ever suffered from boron preservative in food; and, if not, whether he was prepared to withdraw such Regulation.

Mr. N. Chamberlain said that the harmfulness of boron preservatives was thoroughly considered by the Departmental Committee which inquired into the subject. Their report showed that boric acid in small doses had been known to produce ill effects, and that in continued doses it was likely to impair the health of the consumer.

## Swiss Dye Industry and German Competition

THE Swiss aniline dye and indigo industry, which had derived considerable profit from the occupation of the Ruhr, is now feeling the effects of the normal working of the German colour factories, which put up severe competition on the world market. Thus Swiss exports of colours, although they increased in weight from 6,907 to 9,539 tons, fell in value from 69·0 to 68·2 million francs in 1924. Both Great Britain and the United States show a falling off as customers, and some anxiety is felt in the Swiss dye industry regarding the future attitude of the British Government with regard to free trade.

# From Week to Week

THE KING AND QUEEN are to visit Widnes and Runcorn on July 8.

AN ORDER OF ABATEMENT of a smoke nuisance was made by Manchester Corporation on Wednesday against T. Horrocks and Sons, Ltd., chemical manufacturers, of Miles Platting.

Dr. J. F. LOGAN, assistant professor of biochemistry at McGill University, is to be professor of biochemistry at Queen's University, Kingston, Ontario.

THE ANNUAL DINNER of the Engineers' Club will be held on Friday, October 23, 1925, at the Savoy Hotel, when Mr. Winston Churchill will be the guest of the club.

MR. F. T. T. REYNOLDS, governing director of Millwards Merchandise, Ltd., Manchester, is suffering from temporary indisposition and is taking a short holiday.

A CLAIM FOR DAMAGES THROUGH POISONING by bichromate of potash was made by a worker against W. T. Norman and Son, shopfitters, of Bethnal Green, at Shoreditch, on Thursday, June 11. The girl had a poisoned finger. The jury awarded her £6 2s. 6d. damages.

DEALING WITH BORIC ACID IN MARGARINE, Birmingham's City Analyst (Mr. J. F. Liverseege) states in his quarterly report that last year 96 per cent. of the margarine examined contained boric acid. This year in January the figure was only 17 per cent., but had risen to 71 per cent. in March.

THE AJAX ANILINE DYE MANUFACTURING CO., LTD., of 119-120, London Wall, London, ask us to announce, in reference to recently published notices of a resolution to wind up a company bearing a similar name, that the latter company has no connection with the Ajax Aniline Dye Manufacturing Co.

MANCHESTER UNIVERSITY INTELLIGENCE records the following appointments in the Faculty of Technology: Lecturer in Applied Chemistry, Mr. T. K. Walker, M.Sc., Assistant Lecturers in Applied Chemistry, Miss M. Chadwick, M.Sc., and Mr. A. Hancock, M.Sc.; Demonstrator in Chemical Technology, Mr. A. B. Winterbottom, B.Sc.

THE EXPORT CREDITS DEPARTMENT of the Department of Overseas Trade will remove on June 29 next from its present premises at 73, Basinghall Street, E.C.2, to fresh premises at 30-31, King Street, Cheapside, E.C.2. The present telephone number (London Wall, 4713) and telegraphic address (Exportcred) will remain unchanged.

THE BOARD OF TRADE announces that it has appointed Dr. E. F. Armstrong, F.R.S., of the British Dyestuffs Corporation, Ltd., and Mr. H. Sutcliffe Smith, of the Bradford Dyers' Association, to be members of the Dyestuffs Industry Development Committee set up under Subsection 2 (6) of the Dyestuffs (Import Regulation) Act, 1920, in the place of Sir William Alexander and Mr. G. Douglas, resigned.

AT AN EXTRAORDINARY GENERAL MEETING of British Oil and Cake Mills, Ltd., the question of the provisional arrangements with Lever Brothers, Ltd. (see THE CHEMICAL AGE, May 30) was fully explained by the chairman of the company, Mr. J. W. Pearson. The meeting was adjourned until Monday, July 20, when the formal confirmation of the shareholders to the scheme is expected to be carried by a great majority.

GILBERT, MARCHANT AND CO.'s scrap metal warehouses, Stour Wharf, Stour Road, Old Ford, London, E.3, were the scene of a daring robbery during last week-end. The thieves succeeded in getting away with a lorry-load of metal consisting of about 4½ tons of phosphor bronze wormwheels, including a quantity of scrap copper and aluminium. A reward is offered for the first information received leading to the recovery of the metal and the arrest of the thieves.

OIL FROM COAL was referred to at the meeting of the Institution of Gas Engineers, at Westminster, on Thursday, June 11. Mr. Marshall said that at his works at Battersea he had passed over 2,000 tons of coal through their retorts. He had had in view the production not only of a smokeless fuel, but also a good grade of oil which would render us independent of outside supplies. He had succeeded in producing a most remarkable oil, and from that had obtained petrol on which he had driven a motor-car for over 300 miles. Both the oil and the petrol were of a very high grade, and he said that we could produce them from our British coal.

THE REPORTED DISCOVERY OF TWO NEW ELEMENTS by the physicist, Dr. Walter Nonnack, and Fräulein Eva Tacke, assisted by Dr. Otto Berg, is recorded in Berlin. The elements, which are said to have been detected by chemical analysis, and the Röntgen spectroscopic process, had been sought unsuccessfully by several earlier investigators. In minute quantities they may be obtained from a number of mineral substances, of which the principal is platinum ore. Their atomic numbers are 43 and 75, and they have been named masurium and rhenium, after the East Prussian borderland and the Rhine. As the result of this discovery only three elements still remain to be found.

PROFESSOR J. C. M'LENNAN, professor of physics at Toronto University, arrived at Liverpool on Monday.

FIRE CAUSED CONSIDERABLE DAMAGE at the works of the Southern Oil Co., Ltd., Trafford Park, Manchester on Tuesday.

Mr. W. F. GEDDES has been appointed to the professorship of Chemistry at Manitoba Agricultural College, Winnipeg.

AN EXPLOSION AT THE POWDER MILLS of Curtis and Harvey, Ltd., Dalkeith, on Wednesday, killed one girl worker and seriously burned two others.

THE PROTOCOL CONDEMNING CHEMICAL WARFARE was signed by 27 nations (including Great Britain) at the Traffic in Arms Conference at Geneva on Wednesday.

MR. E. A. PERREN, PH.D., A.I.C., research chemist at H.M. Experimental Station at Porton, was married to Miss M. L. Davidge, of Palmers Green, London, recently.

ANOTHER SUGAR BEET factory is to be erected this season—probably near York—by the Anglo-Scottish Beet Sugar Corporation, according to the chairman, Lord Weir.

FIRE BROKE OUT in a stack of charcoal at the chemical works of Burt, Bolton and Haywood, Ltd., at Maesycymmer, on Wednesday, June 10. Considerable damage resulted.

MR. FRANK WEST, chairman and managing director of the Derbyshire Silica Fire Brick Co., has been appointed chairman of the Refractory Materials Section of the Ceramic Society.

DETAILS OF A CHROME IRON DEPOSIT in Southern Rhodesia have just been received by the Imperial Mineral Resources Bureau, 2, Queen Anne's Gate Buildings, London, S.W.1, where they may now be consulted by parties interested.

IMPNEY HALL, DROITWICH, has been sold to Mr. John Ward, of Worcester, who, when the mansion was built fifty years ago for Mr. John Corbett, the salt millionaire, was one of the men employed to instal fittings. Mr. Ward has since become head of the firm that built the hall at a cost of £150,000.

AN INQUEST on Mr. W. J. Dibdin, F.C.S. (whose death was reported in the CHEMICAL AGE last week), resulted in a verdict of "Accidental Death." He was a consulting chemist of West Norwood, and death resulted from scalds following the accidental overturning of a kettle. He was 74.

BRITISH CAPITAL COULD BE WELL EMPLOYED IN POLAND in engineering, petroleum production, electrification and exploitation of natural resources, according to Sir Philip Dawson, who has just returned with a British Parliamentary delegation which has investigated Polish economic and industrial conditions.

REPRESENTATIVES FROM THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS will join in the annual meeting of the Society of Chemical Industry at Leeds from July 13 to 18. They will also hold a joint meeting with the Institute of Chemical Engineers, whose annual meeting will also be held in Leeds during the same week.

THE GEIGY COLOUR CO., LTD., of 35 and 37, Dickinson Street, Manchester, inform us that as from July 1, they will have a branch of the company at Leicester to deal with their interests in the Midlands. Mr. H. B. Wolstenholme, who is well known in trade circles, will be in charge, and will deal with the requirements of dye consumers in the district.

MR. G. F. HORSLEY, an original member of the Institution of Chemical Engineers, has been appointed to the post of Director of Research for the Nitrate Producers' Association of Valparaiso, Chile, at a salary of £3,000 per annum. The Institution of Chemical Engineers has recently successfully started an appointments bureau, and is receiving private information of posts of great importance. It is hoped that all those who have appointments to fill will place particulars of them on the register of the Bureau at Abbey House, Westminster, S.W.1.

A MEETING OF THE CREDITORS of James Ayre and Sons, Ltd., paint manufacturers, Tregare Street, Newport, was held recently at Newport, Mon., when it was reported that the company had gone into voluntary liquidation, and had appointed Mr. G. S. Phillips to act as liquidator. The statement submitted showed liabilities of £3,723 2s., all of which were due to unsecured creditors. The assets were estimated to realise £652 18s. 6d., from which had to be deducted £69 19s. 4d. for preferential claims, leaving net assets of £582 19s. 2d., or a deficiency of £3,140 2s. 10d. so far as the unsecured creditors were concerned. The creditors confirmed the voluntary liquidation.

THE ALBERT MEDAL of the Royal Society of Arts for the current year has been awarded to Lieut.-Colonel Sir David Prain, "for the application of botany to the development of the raw materials of the Empire." Sir David Prain is one of the most distinguished of living botanists. When Director of the Royal Botanic Gardens at Calcutta he developed the Government cinchona plantations of India, and organised a system for the cheap distribution of quinine through the post offices, thereby making the drug familiar in every village of India and saving unnumbered human lives. The Albert Medal was instituted in 1863 and is awarded annually "for distinguished merit in promoting Arts, Manufactures and Commerce."

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LIGNINS.—Lignin bodies. Part III. K. Kürschner. *Brennstoff-Chem.*, June 1, 1925, pp. 177-180.

# Patent Literature

## Abstracts of Complete Specifications

233,813.—Dyeing of acetyl cellulose.—British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, and J. Baddiley and H. Browning, jun., Crumpsall Vale Chemical Works, Blackley, Manchester. Application dates, February 27, 1924, and November 22, 1924.

Acetyl cellulose can be dyed with certain derivatives of quinones of the benzene and naphthalene series from an ordinary hydrosulphite vat such that the acetyl cellulose is not substantially hydrolised. The derivatives employed are the anilides and their substitution products and homologues, *i.e.*, the condensation products of the quinones including their substitution products with amines of the benzene or naphthalene series, also the substances obtained from the quinone anilides by the action of sulphurising agents. The latter thiazines may also be obtained by the action of arylamines on quinone thio derivatives such as the thiosulphonic acids, mercaptans, diquinone sulphides, and the disulphides. Alternatively, the thiazines can be obtained by the condensation of quinones or halogenated quinones with *o*-aminoaryl mercaptans or *o*-aminoaryl-thiosulphonic acids. A large number of examples of the preparation and use of these dyestuffs are given.

233,840. Active absorbing Carbon and Phosphoric Acid and its Compounds, Process for the Manufacture of. R. Duncalfe, "White Beam," Oakwood Avenue, Purley, Surrey; R. B. Drew, 101, Camden Road, London, N.W.1; and J. O. Cutter, 11, Treen Avenue, Barnes, London, S.W.13. Application date, March 29, 1924.

The object is to utilise bone char dust, which is a waste product obtained in the manufacture of bone char. The raw material is re-calcined in a closed retort at 800° C. for 12 hours, and then treated with a 15 per cent. solution of phosphoric acid for 4–5 hours to dissolve out all the inorganic matter. The liquor is passed through vacuum filters, and the carbon is washed with water, and again filtered. The filtrate is mixed with sulphuric acid in proportion less than the equivalent of the calcium present, and then evaporated in a lead vat to 50°–55° Tw. Dicalcium hydrogen phosphate is precipitated, and filtered off, and the liquor containing calcium and magnesium phosphates is treated with 70 per cent. of the equivalent of sulphuric acid. Calcium sulphate is precipitated and filtered off, and the liquor contains phosphoric acid and magnesium and alkali salts, which may be separated.

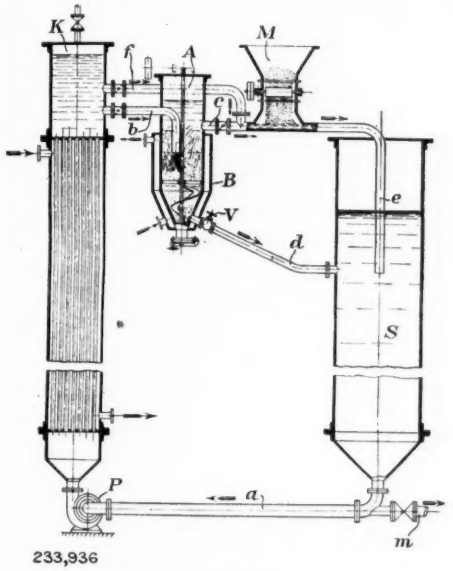
The dicalcium hydrogen phosphate obtained is treated with sulphuric acid, boiled with water, and evaporated to separate the calcium sulphate. The remaining phosphoric acid may in part be diluted to 15 per cent. for treating a further quantity of bone char.

233,874. Cellulose Derivative Compositions. W. G. Lindsay, 11, Astor Street, Newark, N.J., U.S.A. Application date, May 5, 1924.

Cellulose derivatives are rendered non-inflammable by the addition of an aromatic phosphoric-ester and one or more of the following:—Aluminium phosphate, hydrated aluminium fluoride, calcium phosphate, calcium tartrate, calcium citrate, magnesium dihydrogen ortho-antimonate. The aromatic phosphoric ester may be tricresyl phosphate. These additions impart properties to the cellulose derivative varying from that of a hard non-mouldable dense material to that of a thin highly flexible product suitable for veneering fabrics, paper, etc. Pyroxylin, nitrocellulose, acetyl cellulose or other ester or ether may be treated in this manner.

233,936. Precipitating Calcium Saccharate from Liquids containing Sugar, and Separating Excess Lime therefrom. C. Steffen, Sen., 4, Engelberggasse, Vienna III, and C. Steffen, Junr., 75, Taborstrasse, Vienna III. Application date, July 30, 1924.

In this process, a sugar lime having a high proportion of sugar is obtained by effecting a differential separation of the lighter sugar lime from the heavier powdered calcium oxide which is not combined with the sugar. The impure sugar solution passes from a collecting vessel S through a pipe *a* and pump P to a cooler K, and thence through a pipe *b* to a lime separator A, where the heavier lime is deposited. The solution passes on under a lime delivery device M which delivers powdered lime on to the stream of liquid as it passes through the pipe *e* into the vessel S to be circulated again. The treatment is repeated until the desired amount of sugar is precipitated. The circulation is continued after the delivery



233,936

of lime is stopped, and the sugar lime is finally drawn off from the vessel S. The separated lime is then passed from vessel A through pipe *d* to vessel S for treating a further quantity of sugar.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention:—208,175 (Soc. des Etablissements Barbet) relating to continuous rectification of hydrocarbons containing constituents of high boiling point, see Vol. X, p. 175; 212,252 (H. Pereira) relating to manufacture of vat dyes, see Vol. X, p. 496; 215,782 and 220,930 (Farbwerke vorm. Meister, Lucius and Brüning) relating to manufacture of vat dyestuffs, see Vol. XI, pp. 71 and 450; 222,821 (A. Nathansohn) relating to dechlorination of lead products containing lead oxychloride, see Vol. XI, p. 582; 226,512 (Metropolitan-Vickers Electrical Co., Ltd.) relating to means for deoxidising gases containing oxygen, see Vol. XII, p. 185.

## International Specifications not yet Accepted

231,827. Menthol, isomenthol and isomenthone. Rheinische Kampferfabrik Ges., 20, Kasselerstrasse, Oberkassel, Dusseldorf, Germany. International Convention date, April 4, 1924. Addition to 189,450. (See The Chemical Age, Vol. VIII, p. 127.)

Thymol is hydrogenated catalytically, and the mixture of menthol and isomenthol separated by fractional distillation in vacuo. The isomenthol may be mixed with thymol and again hydrogenated, or may be dehydrogenated to isomenthone and hydrogenated again.

231,841. Vinyl ethers and esters. Consortium für Elektrochemische Industrie Ges., 20, Zielstattstrasse, Munich, Germany. International Convention date, April 1, 1924.

These compounds are prepared by the catalytic reaction of acetylene and a compound containing a carboxyl or hydroxyl group. The vinyl compound is removed as soon as it is formed by adding substances which condense or polymerise it, or by diluting the mixture with an indifferent solvent, or one which participates in the reaction. A low pressure is employed, and a temperature below boiling point. In an example, acetylene is passed through a warm mixture of mercury sulphate and acetic acid, and vinyl acetate is distilled

off and condensed or absorbed. Vinyl ether may be obtained by passing acetylene through an emulsion of mercury phosphate in absolute alcohol and ligroin.

231,853. SULPHURIC ACID. H. Petersen, 6, Hohenzollernstrasse, Steglitz, Berlin. International Convention date, April 1, 1924.

The sulphur dioxide is brought into intimate contact with nitrosyl sulphuric acid and other nitrogen-oxygen compounds dissolved in concentrated sulphuric acid, the oxidation being effected without liberation of gaseous nitrogen oxides.

231,863. ABSORPTIVE CARBON. E. Goutal, 60, Boulevard St. Michel, and H. Hennebutte, 62, Rue de Maubeuge, Paris. International Convention date, April 1, 1924.

The product consists of wood, peat or lignite carbonized below 500° C., and a binder of oxidised substances obtained by treating tar from wood, peat or lignite which are decomposable below 500° C. into water and a carbon residue. A small quantity of oxides or salts of copper, zinc, nickel or iron may be added. The mixture is heated gradually to 450° C.

231,885. DYES. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, April 4, 1924.

Diazotised *m*-aminobenzene-azo-salicylic acid or homologues or derivatives are coupled with 1-acidyl-amino-8-naphthol-sulphonic acids to obtain disazo dyes suitable for printing red shades on cotton with chromium acetate. To obtain the *m*-aminobenzene-azo-salicylic acids, diazotised *m*-nitranilines or acidyl-*m*-phenylenediamines are coupled with salicylic acids and reduced or saponified. Components referred to include *m*-phenylene- and *m*-toluylene-diamines and their sulphonic acids, salicylic and cresotinic acids, salicylic sulpho acid, 1-acetyl-amino-8-naphthol-4-sulphonic acid and 4 : 6-disulphonic acid, 1-acetyl- or benzoylamino-8-naphthol-3 : 6-disulphonic acid. Examples are given.

231,886. SYNTHETIC DRUGS. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, April 4, 1924.

4-methoxybenzoic acid is acetylated to obtain 2-acetoxy-4-methoxybenzoic acid, which has antipyretic properties.

231,889. DYES. Durand and Huguenin Soc. Anon., Basle, Switzerland. Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, April 4, 1924.

Leuco vat dyes are treated with chlorsulphonic alkyl esters to obtain products which may be employed for dyeing directly or after saponification to the alkali salt of the acid ester. In an example, leuco thioindigo red is treated with chlorsulphonic ethyl- or methyl ester in presence of pyridine, diluted with water, and filtered. The neutral esters are precipitated by further dilution and acidifying with hydrochloric acid. They may be saponified by dilute caustic soda. Other esters are also described.

231,900. PURIFYING HYDROCARBONS. Akt.-Ges. für Chemiewerte, Mainz, Germany. International Convention date, April 5, 1924.

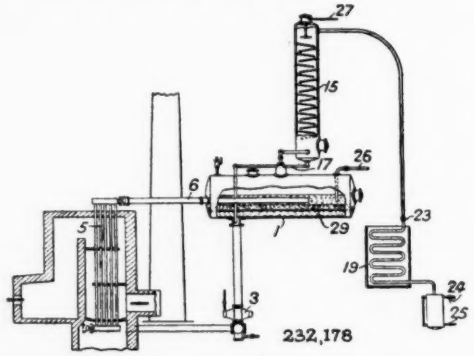
Mineral oils and aromatic hydrocarbons, e.g., benzene and xylene, are purified by acid and then neutralised with lyes absorbed in fuller's earth or kieselguhr. The solid material settles out, and the oil is separated and washed.

231,901. FACILITATING CHEMICAL REACTIONS. Akt.-Ges. für Chemiewerte, Mainz, Germany. International Convention date, April 5, 1924.

A porous substance such as bone black, fuller's earth, or burnt kieselguhr is impregnated with one reagent, and then treated with the other reagent. The process is applicable to actions such as the introduction of groups into organic compounds, sulphurising, nitrating, chlorinating, and nitroso-combination processes, the purification of benzol, xylol, crude petroleum, cracked oils, mineral or tar oils, fats and fatty oils, etc. Detailed examples are given.

232,178. CRACKING HYDROCARBONS. Sinclair Refining Co., 45, Nassau Street, Manhattan, New York. Assignees of E. C. Herthel and H. L. Pelzer, 111, West Washington Street, Chicago. International Convention date, April 8, 1924.

The proportion of pitch in the oil is regulated by passing it through a bed of fuller's earth or silica gel. Oil passes from a drum 1 through a pump 3 to a heater 5, and the oil returns to the drum above a layer of fuller's earth 29. The vapour passes into a reflux condenser 15 supplied with fresh oil at the top, and the reflux liquid passes by a pipe 17 into the oil leaving the drum. Oil containing tar, etc., is withdrawn from above the filtering layer by a pipe 26.

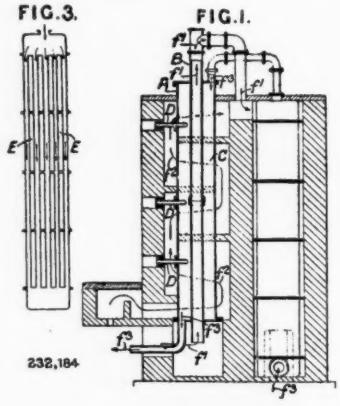



232,185. NITROGEN, AMMONIUM CARBONATE AND SULPHATE. Compagnie de Produits Chimiques et Electro-Metallurgiques Alais, Froges, et Camargue, 126, Rue de la Boetie, Paris. International Convention date, April 14, 1924.

The products of combustion of coke oven gas, lighting gas, poor gas, etc., with a slight excess of air, are treated with hydrogen at a high temperature to remove excess of oxygen, and the carbon dioxide is removed by absorption in ammonia. The ammonium carbonate is converted into ammonium sulphate or urea. Hydrogen is added to the nitrogen to give the proper proportions for the synthesis of ammonia.

232,184. HYDROGEN. Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue, 126, Rue de la Boetie, Paris. International Convention date, April 11, 1924.

In the iron-steam process, the annular reaction chamber C is heated by hot gases outside in a tortuous space $f^2$ and also



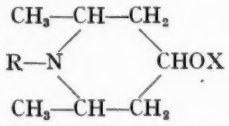

by hot gases in the inner space $f^1$. The iron oxide is reduced by water gas, poor gas, or coal gas passed through the passages $f^3$, and steam is subsequently passed through in the same or the opposite direction. The heating gases pass to a heat regenerator where the reducing gas and steam are brought to the reaction temperature. In a modification, narrow rectangular reaction chambers E may be used.

232,206-7. SYNTHETIC DRUGS. H. Standinger, 81, Hadlaubstrasse, Zurich, Switzerland. International Convention date, April 8, 1924.

232,206. ANÆSTHETICS are obtained by esterifying an N-aralkyl-4-oxypiperidine or a C-substitution derivative having the substituent in the piperidine ring.

232,207. To obtain derivatives of 4-oxypiperidine, a diallylcarbinol ester or a substitution product is converted into its dihydrohalide and the latter condensed with ammonia or a primary aliphatic, aromatic, or aliphatic-aromatic amine

to effect the piperidine ring closure. The products are open-chain tropine compounds



where R is hydrogen, alkyl, aryl or aralkyl, and X represents acidyl. Examples are given of the preparation of the benzoic ester of 2 : 6-dimethyl-N-methyl or phenylethyl-4-oxypiperidine, 2 : 6-dimethyl-N-methyl-4-oxypiperidine, etc.

232,230. DYES. Farbwerke vorm. Meister, Lucius and Brüning, Hoechst-on-Main, Germany. International Convention date, April 9, 1924.

To obtain dyestuffs of the symmetrical indigoid type, an α-anil of a substituted 2 : 3-diketodihydro-thionaphthene is heated with a substituted arylthioglycol-*o*-carboxylic acid in the presence of acetic anhydride, with or without a diluent. Alternatively, an acylated oxythionaphthene is made by treating an arylthioglycol-*o*-carboxylic acid with acetic anhydride, and is then condensed with an α-anil of a 2 : 3-diketodihydro-thionaphthene. Examples are given of dyestuffs from 4-ethoxyphenyl-2-thioglycol-1-carboxylic acid and 4-methyl-6-chloro-2 : 3-diketodihydro-thionaphthene-2-(*p*-dimethylamino)-anil; 5-chloro-4-ethoxyphenyl- or 4-chlorophenyl-2-thioglycol-1-carboxylic acid and 4-methyl-6-chloro-2 : 3-diketodihydro-thionaphthene-2- (*p*-dimethylamino)-anil; 3-methyl-5-brom-1-phenylthioglycol-2-carboxylic acid and 6-ethoxy-2:3-diketodihydro-thionaphthene-2-(*p*-dimethylamino)-anil; 3-acetyloxy-thionaphthene and 5-chlor-7-methyl-2 : 3-diketodihydro-2-(*p*-dimethylamino)-anil. The dyes give red to violet shades on cotton.

232,251. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, April 9, 1924. Addition to 211,223. (See THE CHEMICAL AGE, Vol. X, p. 299.)

Blue to black axo dyes are obtained by coupling tetrazotized 4 : $4^1$-diaminoazobenzene with 4-oxynaphthalene-1-phenylketone. Examples are given using as components (1) tetrazotized 4 : $4^1$-diaminoazobenzene and 4-oxynaphthalene-1-phenylketone, (2) tetrazotized 4-$4^1$-diamino-$3^1$-methoxy-$6^1$-methylazobenzene and 4-oxynaphthalene-1-phenylketone, (3) the tetrazo compound of reduced *m*-nitrobenzeneazo-1-naphthylamine and 4-oxynaphthalene-1-phenylketone.

232,261. PERYLENE COMPOUNDS. H. Pereira, 3, Freyung, Vienna. International Convention date, April 10, 1924.

Perylene is dissolved or suspended in chlorbenzene, carbon tetrachloride, glacial acetic acid, carbon bisulphide or chloroform, and treated with chlorine or a chlorinating agent. In an example, a boiling solution of perylene in glacial acetic acid containing a trace of iodine is treated with chlorine, yielding a precipitate which can be crystallised from toluene into two chloroperylenes melting at 278° C. and 325° C. In other examples, chloroperylenes having melting points of 180° C., 294° C., and 310° C. are obtained.

232,262-3. DYES. H. Pereira, 3, Freyung, Vienna. International Convention date, April 10, 1924.

232,262. PERYLENE is heated with phosphorus trisulphide or pentasulphide in the presence of kieselguhr, boiled with water and then with dilute acid, filtered, and the dye isolated by solution in alkali and precipitation with acid. The dye may be oxidised in alkali solution with hydrogen peroxide and treated with acid, or it may be melted with sodium sulphide and sulphur, yielding other dyes. Other examples describe dyes obtained from perylene-3 : 10-quinone, perylene tetrachloride, and dibenzoyl perylene.

232,263. DYES are obtained by heating dinitroperylene and tetranitroperylene with anhydrous aluminium chloride, yielding olive brown and olive green shades on cotton respectively.

LATEST NOTIFICATIONS.

235,169. Process for the production of azo-dyestuffs insoluble in water. Chemische Fabrik Griesheim-Elektron. June 7, 1924.

235,181. Process and apparatus for the synthetical production of hydrogen cyanide. Norsk Hydro-Elektrisk Kvaelstofaktieselskabet. June 3, 1924.

235,217. Process of dissolving a mixture of hafnium and zirconium salts and of separating hafnium and zirconium. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. June 6, 1924.

235,227. Production of colloidal solutions. Siemens and Halske Akt-Ges. June 7, 1924.

## Specifications Accepted with Date of Application

212,914. Stable colloidal solutions of silver and of silver and mercury, Process of preparing. Agoleum Ges. March 14, 1923.

212,936. Black vat dyestuffs, Manufacture of. Compagnie Nationale de Matières Colorantes et de Produits Chimiques. March 16, 1923.

223,596. Dyestuffs of the pyrone series, Manufacture of. Farbenfabriken vorm. F. Bayer and Co. October 18, 1923.

226,217. Ores and impure materials, Extraction of metals and their compounds from. British Thomson-Houston Co., Ltd. December 14, 1923.

230,796. Fertilisers, Manufacture of. L'Air Liquide Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. March 13, 1924. Addition to 210,399.

229,253. Rubber, Vulcanisation of. G. Bruni, February 15, 1924.

234,533. Hydroxy-anthraquinone derivatives, Manufacture of. J. Thomas, L. J. Hooley, and Scottish Dyes, Ltd., January 26, 1924.

234,547. Metals or their alloys, Treatment of—and the production of the latter. A. L. Pocock, C. T. Calver, and W. H. Watkins. February 27, 1924.

234,564. Coal, peat, bituminous slates and similar substances, Extraction of wax, liquid hydrocarbons, and other bodies from. H. Novak, and J. Trebicky. March 6, 1924.

234,569. Triarylmethane dyes, Manufacture of. W. Carpmael (*Farbenfabriken vorm. F. Bayer and Co.*). March 13, 1924.

234,585. Potassium carbonate, Processes for the production of. H. Klopstock and W. Neumann. April 1, 1924.

234,648. Lead and other metals, Treatment of. W. J. Mellersh-Jackson (*American Machine and Foundry Co.*). June 19, 1924.

234,677. Therapeutic compound, Manufacture of. Wellcome Foundation, Ltd., and W. H. Gray. August 12, 1924.

234,681. Dyestuffs of indigo tint, Manufacture of. Soc. of Chemical Industry in Basle. July 17, 1924. Addition to 199,360.

234,735. Diatomaceous earth, Treatment of. F. W. Golby. (*Celite Co.*) December 28, 1923. Addition to 229,021.

## Applications for Patents

Adelantado, L. Manufacture of phosphate fertiliser. 14,980. June 9.

Badische Anilin-& Soda-Fabrik and Johnson, J. Y. Manufacture of arsenic preparations. 15,121. June 10.

Badische Anilin-& Soda-Fabrik and Johnson, J. Y. Manufacture of vat colouring matters of the benzanthrone series. 15,187. June 11.

Buchner, M. Process of producing hydroxides and carbonates. 15,290. (Germany, June 14, 1924.)

(Cassella and Co., Ges., L.), and Ransford, A. J. Manufacture of arsenic compounds of the aromatic series. 15,017, 15,018. June 9.

Chadburn, W. R., and De Laval Chadburn Co., Ltd. Treatment of shellac varnish. 14,979. June 9.

Coley, H. E. Manufacture of tin. 15,083. June 10.

Coley, H. E. Manufacture of zinc. 15,084. June 10.

Day, E. F. Centrifugal pump. 14,834. June 8.

Dreyfus, H. Manufacture of aliphatic compounds. 15,392, 15,393, 15,394, 15,395, 15,396, 15,397. June 13.

Elektrizitätswerk Lonza. Preparation of metaldehyde. 14,878. June 8. (Germany, June 23, 1924.)

Farbenfabriken vorm. F. Bayer and Co. Manufacture of halogenated alcohols. 15,214. June 11. (Germany, June 12, 1924.)

Farbenfabriken vorm. F. Bayer and Co. Manufacture of arylesters of nitroamino sulphonic acids of the benzene series. 15,412. June 13. (Germany, June 14, 1924.)

Freiberg, G. W. Production of acetone and butyl alcohol. 14,969. June 9. (United States, July 17, 1924.)

Harris, J. E. G., Jones, J. I. M., Wylam, B., Morton, J., Morton Sundour Fabrics, Ltd., and Wilson, J. Dyes and dyeing. 15,194. June 11.

Heyl, G. E. Obtaining desulphurized oil from oil shale, etc. 15,282. June 12.

Imray, O. Y. Soc. of Chemical Industry in Basle. Preparation of dyestuffs. 14,899. June 8.

Lindman, E. I. Production of porous concrete. 14,991. June 9. (Sweden, November 24, 1924.)

Soc. of Chemical Industry in Basle. Manufacture of permanent emulsions. 15,218. June 11.

# London Chemical Market

*The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

*London, June 19, 1925.*

A RATHER better tone has been in evidence during the past week and a better volume of business is reported. Export demand in some directions has been quite brisk.

### General Chemicals

ACETONE is scarce for early delivery, price varying from £75 to £78 per ton.

ACID ACETIC is in fair demand, technical 80% being quoted at £39 per ton, and pure 80% £40 per ton. Export trade in glacial is particularly brisk.

ACID CITRIC is slow of sale. Consumers are using up their surplus stocks, and a continuation of fine weather may be expected to change the situation shortly. Price nominally 1s. 5d. per lb.

ACID FORMIC is in fair demand and is quoted at £48 10s. to £49 per ton for 85%.

ACID LACTIC.—A steady sale is reported, price is firm, 50% by weight being quoted at £43 per ton.

ACID OXALIC has been in rather better request, price unchanged at 3¾d. per lb.

ACID TARTARIC is very quiet, price nominally 11½d. per lb.

ALUMINA SULPHATE.—The fight between the makers continues, but concessions in price are now within very definite limits. 17–18% is quoted at £6 5s. to £6 10s. per ton, ex store.

ARSENIC is in very poor demand, price nominally £24 10s. to £25 per ton.

BARIUM CHLORIDE.—A better volume of business is in evidence. Price £9 10s. to £9 15s. per ton.

CREAM OF TARTAR is firmer at £75 to £79 per ton, according to quantity and make.

EPSOM SALTS.—Unchanged.

FORMALDEHYDE is a very quiet market, price varying from £40 to £42 per ton.

LEAD ACETATE has been in good demand, £45 per ton for white and £43 per ton for brown.

LIME ACETATE.—The market is stagnant and shows a drooping tendency. Grey is quoted £14 10s. per ton, and brown £9 10s. per ton.

METHYL ALCOHOL.—There is no demand, although price seems to have touched bottom. The nominal figure is £45 to £47 per ton c.i.f.

POTASSIUM CHLORATE is scarce at 4½d. to 4¾d. per lb.

POTASSIUM PRUSSIATE is firmer at 7⅝d. to 7½d. per lb.

SODA ACETATE is in small demand, price £21 5s. to £21 10s. per ton.

SODIUM BICHROMATE is in steady demand at English makers' prices.

SODA HYPOSULPHITE is very slow of sale.

SODA PRUSSIATE.—There is only a small demand, but stocks are firmly held, at 4¼d. per lb.

SODA NITRITE has been more inquired for, price £22 15s. to £23 per ton.

### Coal Tar Products

There is little change to report in the position of the market from last week.

90% BENZOL shows a slight falling off in demand, although the price remains unchanged at 1s. 8d. to 1s. 9d. per gallon on rails.

PURE BENZOL has little business doing, but the price remains firm at 1s. 10d. to 1s. 11d. per gallon on rails.

CREOSOTE OIL is quoted at 5½d. to 5¾d. per gallon on rails in the North, while the price in London is from 7d. to 7¼d. per gallon.

CRESYLIC ACID is very dull, and some extremely low prices are reported as having been taken. Its value to-day is about 1s. 7d. to 1s. 8d. per gallon on rails in bulk for the pale quality 97/99%, while the dark quality 95/97% is quoted at 1s. 5d. to 1s. 6d. per gallon on rails.

SOLVENT NAPHTHA is steady at 1s. 3d. to 1s. 4d. per gallon on rails.

HEAVY NAPHTHA is quoted at 1s. 1d. to 1s. 2d. per gallon on rails.

NAPHTHALENES are unchanged, the lower grades being worth from £3 to £3 15s. per ton, while the 74/76 quality is quoted at £5 to £5 10s. per ton, and 76/78 quality at £6 to £6 10s. per ton.

PITCH.—In the absence of business the market is dull. Prices remain unchanged and are more or less nominal at 40s. to 42s., f.o.b. main U.K. ports.

## Latest Oil Prices

LONDON.—LINSEED OIL closed steady at 15s. to 7s. 6d. under yesterday's rates. Spot, £43 10s.; June, £42 7s. 6d.; July-August, £43 10s.; September-December, £43 12s. 6d. RAPE OIL quiet. Crushed crude, £50 10s.; technical refined, £53 10s. COTTON OIL quiet and occasionally 10s. lower; refined common edible, £47; Egyptian crude, £42; deodorised, £49. TURPENTINE quiet and unchanged. American, spot, 70s. 3d. and July-December, 70s. 6d. per cwt.

HULL.—LINSEED.—Spot, £42 7s. 6d.; June and July-August, £42 5s.; September-December, £42 7s. 6d. COTTON OIL.—Bombay, crude, £38; Egyptian, crude, £41 10s.; edible refined, £45; deodorised, £47; technical, £41 10s. PALM KERNEL OIL.—Crushed, naked, £42. GROUNDNUT OIL.—Crushed extracted, £42 10s.; deodorised, £52 10s. SOYA OIL.—Extracted and crushed, £52 10s.; deodorised, £48. RAPE OIL.—Extracted, £49 per ton, net, cash terms, ex mill.

## Nitrogen Products Market

*Export.*—During the last week the demand for export has continued steadily and producers have made sales at £12 2s. 6d. per ton in doubles f.o.b., and £11 10s. per ton in single bags for prompt shipment. Producers are quoting slightly higher prices for shipment August onwards, but very little business has been done for this position. The demand is mostly from the Continent and from the Far East.

*Home.*—The home prices for June were announced in our last week's issue. During the last week the home sales continued to be above those for the same period last year. It is expected that the very low prices will enable the producers to continue their policy of gradually raising prices as the season advances.

*Nitrate of Soda.*—The nitrate of soda market is firm—the announcement that the directorate will give the benefit to buyers for prompt delivery of any drop in price during the season 1925-26 has given the buyers confidence. Cargoes for European ports have changed hands at about £11 18s per ton, c.i.f.

## American Market Movements

(FROM *Drug and Chemical Markets.*)

Potash alum higher on spot. Arsenic steady. Sodium prussiate very firm. Entire list of industrial chemicals holding at firm prices. Benzene very strong. Pure benzene higher. Pyridine advances again. Solvent naphtha and toluene stronger. Intermediate demand increased. Dimethylaniline and meta-nitro-toluidine lower.

Scattered large orders give the impression of increasing business in fine chemicals which may or may not develop to be an actual improvement of conditions. Alkaloids have advanced and quicksilver and codliver oil continue strong.

Few new developments are seen in the crude drug market with prices fairly well established except in cases where stocks are limited. Matico leaves are reported higher with lycopodium, ergot and buchu firm.

# Weekly Prices of British Chemical Products

*The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at retailers' works.*

## General Heavy Chemicals

Acid Acetic, 40% Tech.—£21 to £23 per ton.
Acid Boric, Commercial.—Prices reduced by £5 per ton. Crystal, £40 per ton, Powder, £42 per ton.
Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £10 10s. d/d; Contract, £10 d/d. 4 ton lots.
Bisulphite of Lime.—£7 10s. per ton, packages extra, returnable.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chlorate (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
Copper Sulphate.—£25 to £25 10s. per ton.
Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
Nickel Sulphate.—£38 per ton d/d. Normal business.
Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5d. per lb.
Potassium Chlorate.—2¾d. to 3d. per lb.
Salammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
Salt Cake.—£3 15s. to £4 per ton d/d. In bulk.
Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton, carr. paid.
Sodium Bichromate.—4d. per lb.
Sodium Bisulphite Powder 60/62%.—£16 to £17 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
Sodium Chlorate.—2¾d. per lb.
Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Sulphate (Glauber Salts).—£3 12s. 6d. per ton.
Sodium Sulphide conc. solid. 60/65.—About £15 per ton d/d. Contract £14 15s. Carr. pd.
Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
Sodium Sulphide, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

## Coal Tar Products

Acid Carbolic Crystals.—4½d. to 4¾d. per lb., according to quantity. Quiet demand. Crude 60's. 1s. 5d. to 1s. 6d. per gall. Demand negligible.
Acid Cresylic 97/99.—1s. 8d. to 2s. per gall. Fair business. Pale, 95%, 1s. 5d. to 1s. 9d. per gall. Dark, 1s. 6d. to 1s. 9d. per gall. Slightly better demand.
Anthracene Paste 40%.—3d. to 4d. per unit per cwt.—Nominal price. No business.
Anthracene Oil, Strained.—7d. to 8d. per gall. Unstrained, 6d. to 7d. per gall.
Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons.
Toluol.—90%, 1s. 7d. to 1s. 8d. per gall. More inquiry. Pure, 1s. 11d. per gall.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 8d. per gall. Little demand. Middle Oil, Heavy, Standard specification, 5¾d. per gall. Fair business.
Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 5d. to 1s. 6d. per gall. Demand good. Solvent 90/190, 1s. to 1s. 4d. per gall. Steady business.
Naphthalene Crude.—Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £5 per ton. Market quiet. Whizzed or hot pressed, £6 to £9 per ton.
Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts. Very quiet.
Pitch.—Medium soft, 35s. per ton, according to district. No business until next season.
Pyridine.—90/160, 19s. per gall. Steady, active business. Heavy, 11s. 6d. to 12s. per gall. More inquiry.

## Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid H.—3s. 9d. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
Acid Salicylic, technical.—11d. to 11½d. per lb. Steady demand.
Acid Sulphanilic.—9d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—10d. per lb. d/d.
Aniline Oil.—7½d. per lb. naked at works.
Aniline Salts.—8d. per lb. naked at works.
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—3s. 8d. per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
*p*-Chlorphenol.—4s. 3d. per lb. d/d.
*p*-Chloraniline.—3s. per lb. 100% basis.
*o*-Cresol 29/31° C.—3d. per lb. Demand quiet.
*m*-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
*p*-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
Dichloraniline.—2s. 3d. per lb.
Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
*p*-Dichlorbenzol.—£85 per ton.
Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
Dimethylaniline.—2s. 2d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzol.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. per lb. naked at works.
Diphenylaniline.—2s. 10d. per lb. d/d.
G. Salt.—2s. 2d. per lb. 100% basis d/d.
Monochlorbenzol.—£63 per ton.
*a*-Naphthol.—2s. 3d. per lb. d/d.
*B*-Naphthol.—1s. per lb. d/d.
*a*-Naphthylamine.—1s. 3½d. per lb. d/d.
*B*-Naphthylamine.—3s. 9d. per lb. d/d.
*m*-Nitraniline.—4s. 2d. per lb. d/d.
*p*-Nitraniline.—2s. 2d. per lb. d/d.
Nitrobenzene.—5½d. per lb. naked at works.
*o*-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
Nitronapthalene.—10d. per lb. d/d.
*p*-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
*p*-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.
*m*-Phenylene Diamine.—4s. per lb. d/d.
*p*-Phenylene Diamine.—9s. 9d. per lb. 100% basis d/d.
R. Salt.—2s. 4d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
*o*-Toluidine.—10d. per lb.
*p*-Toluidine.—2s. 3d. per lb. naked at works.
*m*-Toluylene Diamine.—4s. per lb. d/d.

## Wood Distillation Products

Market quiet in sympathy with general commercial depression.

Acetate of Lime.—Brown £9 10s. to £10. Quiet market. Grey, £15 per ton. Liquor, 9d. per gall. 32° Tw.
Acetone.—£73 per ton.
Charcoal.—£7 5s. to £8 10s. per ton, according to grade and locality. Fair demand.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 9d. per gall. Unrefined.
Wood Naphtha, Miscible.—4s. 3d. per gall. Only moderate market. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P.
Wood Tar.—£4 per ton. Demand slack.
Brown Sugar of Lead.—£43 per ton.

## Rubber Chemicals

Antimony Sulphide.—Golden, 7¼d. to 1s. 5d. per lb., according to quality. Crimson, 1s. 5d. to 1s. 7½d. per lb., according to quality.
Arsenic Sulphide, Yellow.—2s. per lb.
Cadmium Sulphide.—4s. 4d. per lb., according to quantity.
Carbon Bisulphide.—£32 to £35 per ton, according to quantity.
Carbon Black.—6d. to 6½d. per lb., ex wharf.
Carbon Tetrachloride.—£62 to £67 per ton, according to quantity, drums extra.
Chromium Oxide, Green.—1s. 4d. per lb.
Indiarubber Substitutes, White and Dark.—5¾d. to 7¼d. per lb.
Lamp Black.—£48 per ton, barrels free.
Lead Hyposulphite.—9d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£16 to £18 per ton f.o.r. London.
Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—4d. per lb., carboys extra.
Sulphur Precip. B.P.—£56 to £65 per ton.

Thiocarbanilide.—2s. 6d. per lb.
Vermilion, Pale or Deep.—5s. 6d. per lb. Dearer.
Zinc Sulphide.—1s. 1d. per lb.

### Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£41 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—2s. 8d. per lb. British makers meeting foreign competition in quality and price.
Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.
Acid, Boric B.P.—Prices reduced by £5 per ton. Crystal £46 per ton, Powder £50 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 4d. to 1s. 4½d. per lb., less 5% for ton lots. Seasonable demand increasing.
Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
Acid, Pyrogallic, Crystals.—6s. per lb. for 1 cwt. lots. 7s. 6d. per lb. for 7-lb. lots, according to quantity. Steady market.
Acid, Salicylic.—1s. 3d. to 1s. 6d. per lb., according to quantity. Supplies exceed demand.
Acid, Tannic B.P.—2s. 9d. per lb. Quiet steady demand.
Acid, Tartaric.—1s. 1d. per lb., less 5%. Very firm. Demand good.
Amidol.—9s. per lb., d/d.
Acetanilide.—1s. 7d. per lb. for quantities.
Amidopyrin.—13s. 9d. per lb.
Ammonium Benzoate.—3s. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—11s. 6d. per lb. Price lower owing to competition.
Benzonaphthol.—3s. 5d. to 4s. per lb. spot.
Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
Bismuth Carbonate.—10s. 6d. to 12s. 6d. per lb.
Bismuth Citrage.—10s. 3d. to 12s. 3d. per lb.
Bismuth Salicylate.—9s. to 11s. per lb.
Bismuth Subnitrate.—8s. 8d. to 10s. 8d. per lb. according to quantity.
} The price of Bismuth Metal has been raised from 5s. to 7s. 6d. per lb. Bismuth Salts have been advanced accordingly.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 1s. 11d. to 2s. 1d. per lb.; sodium, 2s. 1d. to 2s. 2d. per lb.; ammonium, 2s. 4d. to 2s. 6d. per lb., all spot. Market very firm. British or Imported.
Calcium Lactate.—1s. 6½d. to 1s. 8d., according to quantity. Fair demand and steady market.
Chloral Hydrate.—3s. 6d. per lb., duty paid. Slightly lower.
Chloroform.—2s. 5½d. to 2s. 7½d. per lb., less 2½% according to quantity.
Creosote Carbonate.—6s. 9d. per lb. Little demand.
Formaldehyde.—£40 per ton, in barrels ex wharf.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
Guaiacol Carbonate.—7s. to 7s. 3d. per lb.
Hexamine.—2s. 4d. per lb. for cwt. lots.
Homatropine Hydrobromide.—25s. to 30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.
Hydroquinone.—4s. 3d. per lb. Nominal.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb. Green, 2s. 6d. to 2s. 11d. per lb. U.S.A., 2s. to 2s. 2d. per lb.
Magnesium Carbonate.—Light Commercial, reduced to £34 per ton net. Light pure, £46 per ton.
Magnesium Oxide.—Light Commercial, £70 per ton, less 2½%, price reduced; Heavy Commercial, reduced to £24 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
Menthol.—A.B.R. recrystallised B.P., 43s. per lb.; June delivery. Synthetic, 22s. 6d. to 27s. 6d. per lb., according to quality. English make. Market rather easier.
Mercurials.—Fairly steady. Mercury slightly firmer. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 7d. to 3s. 9d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
Methyl Salicylate.—1s. 5½d. to 1s. 8d. per lb., according to quantity.
Methyl Sulphonal.—18s. 3d. per lb. Cheaper.
Metol.—11s. per lb. British make.
Morphone and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—2s. for B.P. quality. Lower.
Paraldehyde.—1s. 2d. to 1s. 4½d. per lb., in free bottles and cases.
Phenacetin.—4s. 4d. per lb. in cwt. lots. Unsettled. Supplies exceed demand.
Phenazone.—6s. 3d. to 6s. 6d. per lb. Spot price lower than forward.
Phenolphthalein.—4s. 3d. to 4s. 6d. per lb. for cwt. lots.
Potassium Bitartrate 99/100% (Cream of Tartar).—83s. per cwt., less 2½% for ton lots.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 7½d. per lb., spot; commercial, 8d. to 8½d. per lb., carriage paid. Slight reaction after recent advance.
Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
Resorcin.—4s. 5d. per lb. In fair quantities.
Saccharin.—63s. per lb. in 50 lb. lots.
Salol.—3s. 6d. per lb., for cwt. lots. Slightly dearer.
Silver Proteinate.—12s. per lb. for satisfactory product light in colour.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb. From natural benzoic acid. Supplies of good quality available.
Sodium Citrate, B.P.C., 1911.—1s. 7d. to 1s. 11d. per lb., according to quantity. U.S.P. 1s. 10d. to 2s. 2d. per lb.
Sodium Hyposulphite, Photographic.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
Sodium Salicylate.—Powder, 2s. to 2s. 1d. per lb. Crystal, 2s. to 2s. 2d. per lb. Flake, 2s. 3d. per lb. Strong demand.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity; 1-cwt. kegs included.
Sulphonal.—12s. 8d. per lb. Small demand resulted in reduced price.
Thymol.—17s. per lb. Higher.

### Perfumery Chemicals

Acetophenone.—9s. 6d. per lb.
Aubepine (ex Anethol).—10s. per lb.
Amyl Acetate.—3s. per lb.
Amyl Butyrate.—6s. 6d. per lb.
Amyl Salicylate.—3s. 1½d. per lb.
Anethol (M.P. 21/22° C.).—5s. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 7½d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 7½d. per lb.
Benzaldehyde free from Chlorine.—3s. per lb.
Benzyl Benzoate.—3s. per lb.
Cinnamic Aldehyde Natural.—14s. 9d. per lb.
Coumarin.—14s. 6d. per lb.
Citronellol.—20s. per lb.
Citral.—9s. per lb.
Ethyl Cinnamate.—9s. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—10s. per lb.
Geraniol (Palmarosa).—28s. 6d. per lb.
Geraniol.—9s. 6d. to 18s. 6d. per lb.
Heliotropine.—6s. 3d. per lb.
Iso Eugenol.—15s. per lb.
Linalol ex Bois de Rose.—24s. 6d. per lb.
Linalyl Acetate.—24s. 6d. per lb.
Methyl Anthranilate.—10s. per lb.
Methyl Benzoate.—5s. per lb.
Musk Ambrette.—50s. per lb.
Musk Ketone.—34s. 6d. per lb.
Musk Xylol.—9s. 9d. per lb.
Nerolin.—4s. 6d. per lb.
Phenyl Ethyl Acetate.—15s. per lb.
Phenyl Ethyl Alcohol.—14s. per lb.
Rhodinol.—38s. 6d. per lb.
Safrol.—1s. 8d. per lb.
Terpineol.—1s. 10d. per lb.
Vanillin.—25s. to 25s. 6d. per lb.

### Essential Oils

Almond Oil, Foreign S.P.A.—13s. 3d. per lb.
Anise Oil.—2s. 9d. per lb.
Bergamot Oil.—15s. 9d. per lb.
Bourbon Geranium Oil.—19s. per lb.
Camphor Oil.—60s. per cwt.
Cananga Oil, Java.—11s. 3d. per lb.
Cinnamon Oil, Leaf.—6d. per oz.
Cassia Oil, 80/85%.—9s. 3d. per lb.
Citronella Oil.—Java, 85/90%, 4s. 6d. per lb. Ceylon, 3s. to 3s. 2d. per lb., according to quality. Firmer with higher prices for forward delivery.
Clove Oil.—7s. 6d. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—French 38/40% Esters, 31s. 6d. per lb.
Lemon Oil.—4s. 6d. per lb. Advanced again.
Lemongrass Oil.—5s. 3d. per lb.
Orange Oil, Sweet.—10s. 9d. per lb.
Palma Rose Oil.—15s. 3d. per lb.
Otto of Rose Oil.—Bulgarian, 40s. per oz. Anatolian, 26s. 6d. per oz.
Palma Rosa Oil.—15s. 6d. per lb.
Peppermint Oil.—Wayne County. No good quality materials available. Japanese, 15s. 9d. per lb.
Petitgrain Oil.—9s. per lb.
Sandal Wood Oil.—Mysore, 26s. per lb. Australian, 18s. 6d. per lb.

# Scottish Chemical Market

*The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

*Glasgow, June 19, 1925.*

DURING the past week the heavy chemical market, although fairly steady, has been quiet. The only notable change is in magnesium chloride, which, in consequence of another attempt to form a syndicate, is quoted about 30s. per ton higher.

### Industrial Chemicals

ACID ACETIC.—In moderate request and price unchanged. 98/100% Glacial, £56 to £67 per ton according to quality and packing, c.i.f. U.K. ports. 80% Pure, £40 to £42 per ton. 80% Technical, £39 to £41 per ton, packed in casks c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flaked £40 per ton. Powdered, £42 per ton, packed in bags, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Remains unchanged at 4½d. per lb., delivered.

ACID CITRIC, B.P. CRYSTALS.—Now quoted 1s. 4¾d. per lb., less 5%, ex store. Offered for prompt shipment at 1s. 4½d. per lb., less 5%, ex wharf.

ACID FORMIC 85%.—Now offered from the Continent at about £48 per ton, c.i.f. U.K. ports. Spot material quoted £49 to £50 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—Usual steady demand, quoted £23 15s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—In moderate demand and price unchanged at 3¾d. per lb., ex store, spot delivery. Offered for prompt shipment at about 3½d. per lb., c.i.f. U.K. ports.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In moderate demand and price unchanged at about 1s. per lb., less 5%, ex store. Offered for prompt shipment at a fraction less.

ALUMINA SULPHATE, 17/18% IRON FREE.—Quoted £6 15s. per ton, ex store. Spot delivery. Offered for prompt shipment from the Continent at about £6 5s. per ton, c.i.f. U.K. ports.

ALUM, LUMP POTASH.—Quoted £9 5s. per ton, ex store. Offered from the Continent at £8 per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Unchanged at 1s. 4½d. per lb., ex station, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton. Packed in 5 cwt. casks, delivered U.K. ports.

AMMONIA LIQUID 880°.—In steady demand. Unchanged at 2½d. to 3d. per lb., delivered, according to quantities.

AMMONIA MURIATE.—Grey galvaniser's crystals of English manufacture quoted £28 10s. per ton, ex station. Offered from the Continent at about £24 10s. per ton, c.i.f. U.K. ports. Fine white crystals on offer £19 15s. per ton, c.i.f. U.K. ports.

ARSENIC.—Refined white Cornish arsenic quoted £25 per ton, ex wharf, prompt despatch from works. Spot lots about £26 per ton, ex store. Foreign arsenic quoted £23 per ton, c.i.f. U.K. ports.

BARIUM CARBONATE 98/100%.—Quoted £7 10s. per ton, c.i.f. U.K. ports, prompt shipment.

BARIUM CHLORIDE 98/100%.—English material unchanged at about £10 5s. per ton, ex store. Offered from the Continent at £8 10s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots quoted £10 10s. per ton, ex station. Contracts 20s. per ton less.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton. Crystals, £25 per ton. Powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental on offer at about £3 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks free.

COPPER SULPHATE.—Quoted £24 10s. per ton, f.o.b. U.K. ports for export. Continental available at about £23 per ton, ex store.

FORMALDEHYDE 40%.—Quoted £39 per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £40 10s. per ton, ex store.

GLAUBER SALTS.—Quoted £4 per ton, ex store, for English material. Continental on offer at about £3 per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material unchanged at about £42 to £42 10s. per ton, ex store. Offered from the Continent at about £39 10s. per ton c.i.f. U.K. ports.

LEAD, WHITE.—Quoted £43 per ton ex store, spot delivery.

LEAD ACETATE.—White crystals quoted £44 5s. per ton, ex store spot delivery. Brown quality £43 per ton. White crystals offered from the Continent at £43 5s. per ton, c.i.f. U.K. ports. Brown about £37 per ton, c.i.f. U.K. ports.

LEAD NITRATE.—Unchanged at about £42 10s. per ton ex station.

MAGNESITE, GROUND CALCINED.—Usual steady demand and prices unchanged at about £8 per ton, ex station.

MAGNESIUM CHLORIDE.—Considerably advanced in price owing to new Syndicate having been formed. Now quoted £5 per ton, c.i.f., U.K. ports. Some spot material still available at considerably less.

POTASH CAUSTIC, 88/92%.—Unchanged at about £29 per ton, ex wharf, prompt shipment from the Continent. Spot material available at about £30 10s. per ton, ex store.

POTASSIUM BICHROMATE.—Price for home consumption, 5d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £26 per ton, ex store, spot delivery. On offer from the Continent at £25 per ton, c.i.f. U.K. ports. 80/85% quality quoted £21 5s. per ton c.i.f. U.K. ports.

POTASSIUM CHLORATE.—Unchanged at about 4d. per lb., ex store, for spot delivery. Limited quantities available for prompt shipment at 3¾d. per lb., c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Refined granulated 99%, quoted at about £28 per ton, ex store. Quoted £24 10s. per ton, c.i.f. U.K. ports for prompt shipment from the Continent.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—On offer at 7¼d. per lb., ex store. Offered for prompt shipment from the Continent at about 7¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—In little demand, quoted 7d. to 7¼d. per lb., ex store.

SODA CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 12s. 6d. per ton; broken 60%, £17 2s. 6d. per ton. Powdered 98/99%, £21 7s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Offered from the Continent at £18 10s. per ton, c.i.f. U.K. ports. Spot material quoted £21 per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM CARBONATE, SODA CRYSTALS.—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Commercial quality offered from the Continent at £8 5s. per ton, c.i.f. U.K. ports. English material unchanged at £9 10s. per ton, ex station. Pea crystals, £14 per ton, ex station.

SODIUM NITRATE.—Quoted £13 per ton, ex store. 96/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE 100%.—Spot material now offered at £24 per ton, ex store. Quoted £22 per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—In little demand. Nominally 4d. per lb., ex store, but could be obtained for less.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption £3 10s. per ton, f.o.r. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English manufacturers quote 60/62% solid, £15 per ton; broken £1 per ton more; flake £2 per ton more; crystals 31/34% £9 5s. per ton, carriage paid U.K. stations, minimum 4-ton lots, with slight reduction for contracts over a period. 60/62% solid offered from the Continent at about £10 15s. per ton c.i.f. U.K. ports; broken £1 per ton more; 30/32% crystals £8 5s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; ground, £8 5s. per ton, ex store, prices nominal.

ZINC CHLORIDE 98/100%.—Quoted from the Continent at £24 5s. per ton, c.i.f. U.K ports; 97/98% of English manufacture on offer at £25 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Commercial crystals on offer from the Continent at about £12 per ton, c.i.f. U.K. ports.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

### Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHOL.—Fair home inquiries, 2s. 2d. per lb.

DIPHENYLAMINE.—Good home inquiries, 2s. 11d. to 3s. per lb.

ETHYL BENZYL ANILINE.—Good home inquiries, 5s. 9d. per lb.

ORTHONITROTOLUOL.—Good home inquiries, 5s. 6d. per lb.

PARANITRANILINE.—Fair home and export inquiries, 2s. 1d. to 2s. 2d. per lb.

R. SALT.—Some home inquiries, 2s. 4d. per lb. per 100%.

METAPHENYLENEDIAMINE.—Fair home inquiries, 3s. 10d. to 4s. per lb.

NAPHTHIONIC ACID.—Some home inquiries, 2s. 2d. to 2s. 3d. per lb. per 100%.
KOCH ACID.—Small home inquiries, 1s. 10½d. per lb. per 100%.
DICHLORBENZIDINE.—Fair export inquiries, 8s. per lb.
FREUNDS ACID.—Fair export inquiries, 7s. 5d. per lb.
ORTHO ANISIDINE.—Fair export inquiries, 8s. per lb.

# The Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

*Manchester, June 18, 1925.*

BUSINESS in chemicals in this centre continues to be very seriously affected by the prevailing dullness in the cotton trade and the other important branches of industry which normally consume large quantities of heavy chemicals. The demand pretty well all round is only on a moderate scale, both on home trade account and for shipment, most of the transactions relating to comparatively small parcels. Under the circumstances the fact that prices are keeping up so well is a fairly clear indication that in most lines of chemicals they have about touched bottom.

### Heavy Chemicals

Phosphate of soda is attracting only a limited amount of attention, with prices ranging from £12 10s. to £12 15s. per ton. The demand for saltcake is quiet and values have an easy tendency at £3 12s. 6d. to £3 15s. per ton. Glauber salts are also comparatively inactive though unchanged at £3 10s. per ton. Hyposulphite of soda is maintained at £13 15s. to £14 per ton for photographic crystals and round £9 for commercial, a fair amount of business being done. Prussiate of soda is steady and in moderate request at 3⅞d. per lb. Caustic soda is in fair demand for home consumption and for export, values ranging from £15 12s. 6d. per ton for 60 per cent. material to £18 for 76 to 77 per cent. Soda crystals are unchanged and in quietly steady request at £5 5s. per ton. Bichromate of soda is rather quiet, but values are held at 5d. per lb. Chlorate of soda is firm at round 3d. per lb., with business on a fair scale. Sulphide of sodium is rather inactive at £13 15s. per ton for 60 to 65 per cent. concentrated solid and £9 10s. per ton for crystals. Alkali meets with a fair demand and prices are firm at £6 15s. per ton. Bleaching powder is attracting little attention from buyers although at £9 10s. per ton values are unchanged. Acetate of soda is quiet but steady at round £20 per ton. Bicarbonate of soda is quoted at £10 10s. per ton, with only a small amount of trade being done.

Caustic potash is on offer at £29 to £30 per ton, but the demand is on quiet lines. Carbonate of potash keeps steady and in moderate request at £24 10s. to £25 per ton. Permanganate of potash is well held at 6½d. per lb. for commercial quality and round 8d. for pharmaceutical. Prussiate of potash is quiet but steady at about 7d. per lb. Bichromate of potash is in rather limited demand at 5d. per lb. Chlorate of potash is unchanged at about 3½d. per lb.

Little buying interest is being shown in arsenic; white powdered, Cornish makes, is currently quoted in Manchester at from £25 to £26 per ton. Sulphate of copper is in quiet demand, but values are little changed from recent levels at £24 10s. to £25 per ton. Epsom salts are in rather limited request, with prices maintained at £4 5s. to £4 10s. per ton for commercial and round £6 for B.P. quality. Acetate of lead is quiet but fairly steady at £45 per ton for white and £39 to £40 for brown. Nitrate of lead is still quoted at about £41 per ton, but the demand is restricted. Acetate of lime is steady at £14 10s. to £15 for grey and £9 5s. for brown.

### Acids and Tar Products

Acetic acid is not too active, but values are held at about £39 per ton for commercial, 80 per cent., and £67 per ton for glacial. Oxalic acid is dull and prices easy at about 3¾d. per lb. Citric acid is firm and in fair request at 1s. 4½d. to 1s. 5d. per lb. Tartaric acid is amintained at 1s. per lb.

Among coal-tar products pitch is quiet and nominal at round 41s. per ton. Creosote oil is steady at round 6d. per gallon. Solvent naphtha is in poor request but values are unchanged at 1s. 5d. to 1s. 5½d. per gallon. Carbolic acid is very dull at 4½d. per lb. for crystals and 1s. 6d. per gallon for crude material. Naphthalenes are in limited demand at round £14 per ton for refined and from £4 5s. for crude.

# A New Corrosion Preventive

### Remarkable Results of a Mond Chemist's Discovery

THE announcement of a new Mond company, the Mond Tar By-Products Syndicate, to put on the market a colloidal bituminous paint now being used extensively in the factories and workshops of the group, has a very considerable significance for the whole engineering industry, if the claims made for the new preservative are substantiated in general practice.

This paint, with a guaranteed 40 per cent. bitumen content, ground and mixed with a spirit base to give it a remarkable colloidity, was produced some years ago from a formula discovered by a chemist in the employment of the South Staffordshire Mond Gas Co. He was endeavouring to solve the problem of the firm's high maintenance costs, due to the corrosive action of the fumes from the power gas and sulphate of ammonia plant on the steel and wood fittings. The results obtained exceeded expectation, and when further tests were carried out the paint gave evidence of very diverse properties.

It has been tested on a surface registering a constant heat of 725° Fahrenheit and, at the time of writing (three months after the date of application) it remains as fresh as on the day it was applied. Other paints had blistered off in five days or less. A special variety was used to cover a factory roof for which a permanently moist surface was desired, and two years' exposure has failed to dry it. The average speed of drying of the standard quality is about five hours.

But it is the corrosion-resisting property of the new paint ("Melanoid" has been chosen as the name by which it is to be known) that is of most interest to the steel and engineering industries. Sir Robert Hadfield has computed (in a paper read to the Institution of Civil Engineers, 1922) that the annual cost of wastage due to rusting of the world's steel and iron is 700 million pounds sterling. He also estimates that two-thirds of the annual production of steel and iron goes to repairing the damage due to corrosion, leaving only one-third of the annual output for development purposes.

In 1922, when the production of steel was exceptionally low—33 million tons—withdrawals owing to corrosion and the replacement so brought about amounted to 29 million tons. Alloy steels, which have a high capacity for resisting rust, are being used experimentally, but their cost is against their general employment.

Sir Alfred Mond, who is sponsoring the discovery, is of the opinion, after several years of severe testing in the Mond Gas Works at Dudley and elsewhere, that the new paint offers a powerful weapon for use in the anti-corrosion fight. Apparently, its exceptional colloidity gives it the property of "keying itself" into the metal to which it is applied, practically becoming a part of it. It is thus able to expand and contract with the metal, and consequently avoid cracks, an important factor in corrosion resistance. This colloidal property is the more remarkable because of the high bitumen content of the paint. The natural black variety is guaranteed to contain virtually 100 per cent. bitumen. Weather, acid fumes, alkalis, heat, cold, and damp seem to have no effect on it.

As the quest for a preservative paint has been pursued with indifferent success for some time it will be interesting to see whether Melanoid is found as satisfactory in the wider industrial world as it is said to have proved itself in the Mond works. Several firms are experimenting with it at the moment, and a large shipload has been ordered for use in the Japanese reconstruction schemes at Tokio. If it is generally taken up its influence on the steel industry may be far-reaching.

### India's Dye Imports

DURING the year ending March, 1925, British India's total imports of coal-tar dyestuffs advanced from 251 to 256 lakhs, due to slightly increased takings of alizarines. The German share advanced from 181 to 191 lakhs, while that of the United Kingdom fell from 27 to 8 lakhs. In addition to the arrivals from Germany imports from Holland of 23 lakhs and from Belgium of 16 lakhs were also recorded; these were presumably German dyes shipped from Dutch and Belgian ports. American shipments showed a slight decline from 11 to 9 laks.

# Company News

BENN BROTHERS, LTD.—An interim dividend of 3 per cent., less tax, has been declared, payable on July 1.

COURTAULDS, LTD.—The dividend on the 5 per cent. cumulative preference shares will be paid on July 1 next.

B. LAPORTE, LTD.—The dividend on the preference shares for the half year ended June 30, 1925, will be paid on that date.

LAUTARO NITRATE CO.—A second interim dividend has been declared on account of the year 1925 of 5 per cent., or 5s. per share.

MINING CORPORATION OF CANADA.—An interim dividend of 12½ cents per share, less tax, will be paid on July 30 to holders registered on July 13.

ROPP TIN CO.—The directors have declared an interim dividend of 20 per cent., less tax, payable on July 10, to holders on the books on June 19.

PINCHIN, JOHNSON AND CO.—The usual dividend, at the rate of 6½ per cent. per annum, less tax, is announced, on the preference shares for the six months to June 30.

UNITED INDIGO AND CHEMICAL CO.—A dividend of 5 per cent. per annum, subject to tax at 4s. 3d. in the £, is announced for the six months ending June 30 in respect of the preference shares.

NATIONAL DRUG AND CHEMICAL CO. OF CANADA.—The secretary states it has been decided that the interim dividend be deferred until the results of this year's operations are ascertained.

IDRIS HYDRAULIC TIN CO.—The directors have declared a first interim dividend of 1s. per share, less tax at 4s. 1½d. in the £, in respect of the year 1925, payable on June 26 to holders registered on June 10.

BRITISH COTTON-SEED PRODUCTS.—The accounts for the year ended March 31 show a net profit of £1,008, against a loss of £3,389 for the previous year. There is now a total debt to profit and loss account of £12,486.

BRUNNER, MOND AND CO., LTD.—At an extraordinary general meeting of Brunner, Mond and Co., Ltd., held on Wednesday, the resolution passed at the annual meeting authorising certain alterations of articles of association was submitted for confirmation. The resolution was unanimously adopted.

BARRENECHEA NITRATE CO.—After providing for stoppage and London expenses there is a loss of £1,588 for the year 1924. The sum of £8,266 has been transferred from reserve account to the credit of the profit and loss account, leaving a credit on the latter account of £3,582. It is proposed to distribute a dividend of 5 per cent., less tax.

ZINC CORPORATION.—The profit for the year 1924 was £375,295, to which is added the balance of last year's appropriations for mine development and new plant, now written back, £45,485. The total dividend for the year on the participating preference shares is 45 per cent. (against 35 per cent), and on the ordinary shares 50 per cent. (against 30 per cent.). The sum of £13,168 is carried forward (against £19,756 brought in).

CAPE ASBESTOS CO.—A net profit of £18,325 is reported for the year 1924, against £15,591 for 1923. An addition of £2,250 has been made to reserve, and £2,000 to staff benefit fund. A dividend of 10 per cent., less tax, is again proposed on the ordinary shares, absorbing £5,541, a similar sum to which is to be distributed to preference shareholders, in addition to the fixed dividend of 5 per cent. The amount to be carried forward is raised from £5,570 to £6,238.

SHIP CANAL PORTLAND CEMENT.—For the year ended March 31, 1925, after charging all expenses, including maintenance, repairs and debenture interest, etc., there is credit on profit and loss of £50,946. The directors have transferred £20,000 to depreciation account, and as articles of association provide that there shall be placed to credit of a preference shares dividend reserve account amount equal to one year's dividend on preference shares for time being issued, it is proposed to transfer to credit of that fund £6,500. It is proposed to pay a dividend of 5 per cent. per annum, less tax, on the ordinary capital, and carry forward £9,167.

EVANS, SONS, LESCHER AND WEBB.—The report for the year 1924 shows a trading profit of £20,065. To this has to be added transfer fees and the net amount due from the Inland Revenue for the recovery of excess profit duty, and after deducting interest on bank overdrafts, debentures and mortgages, and charges in respect of the reconstruction scheme, there remains a credit balance of £31,693, which has been applied in reduction of the amount standing to the debit of the profit and loss account as on December 31, 1923. A reconstruction scheme will be submitted in the near future, and the directors think that the scheme, when presented, will meet with the approval of the shareholders and warrant their acceptance.

## New Chemical Trade Marks

### Applications for Registration

*This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.*

*Opposition to the Registration of the following Trade Marks can be lodged up to July 10, 1925.*

"SENTOCYM."

458,711. For chemical substances prepared for use in medicine and pharmacy. Class 3. Kalle and Co., Aktien-Gesellschaft (a Company incorporated under German law), 23, Rheinstrasse, Biebrich-on-Rhine, Germany, manufacturers and merchants. May 7, 1925.

*Opposition to the Registration of the following Trade Marks can be lodged up to July 17, 1925.*

"ACIDSTONE."

455,158. For anto-corrosives. Walter Hayhurst, trading as Guthrie and Co., 8, St. James's Chambers, Accrington; chemical engineer. January 8, 1925. (To be Associated. Sect. 24.)

"PYROLYTE."

456,285. For furnace cements. Class 1. The General Refractories Co., Ltd., Kelham Islands Firebrick Works, Alma Street, Sheffield; and 28, Blonk Street, Sheffield; miners, quarriers and manufacturers. February 14, 1925.

"TRICOL."

457,002. For wood preservatives. William Howard Hill, trading as W. H. Hill and Co., 73, Leadenhall Street, London, E.C.3.; manufacturer. March 9, 1925.

"SUNMAID."

458,410. For dyes. Class 1. Ethel Margaret Dickson, 10, Mayfield Road, Alexander Park, Manchester; manufacturer. April 28, 1925.

"KEEMAK."

457,432. For raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures, not included in other classes. Class 4. Robert Bowran and Co., Ltd., 4, St. Nicholas' Buildings, Newcastle-on-Tyne; manufacturers. March 21, 1925. (To be Associated. Sect. 24.)

### Galician Oil Industry Increasing

THE British Commercial Secretary at Warsaw, in his report on the industrial, commercial, and economic situation in Poland, states that last year was one of the most critical periods through which the Galician oil industry has yet passed. Although the Boryslaw-Tustanowice-Mraznica field supplied seven-eighths of the crude oil produced in Galicia, this output was only 20 per cent. of the 1910 and 35 per cent. of the 1914 output. The Bitkow field in Eastern Galicia is, however, developing satisfactorily, and its exploitation is easier, as oil is found at about 700 metres, while in the other fields the depth of the wells ranges between 1,500 and 2,000 metres. In this district very satisfactory results have been obtained with the Pennsylvanian Galbe tool drilling system, which may gradually substitute the Canadian pole system which has until now been in use. The Standard Oil Company have made considerable purchases of oil-bearing territory, and have started borings on a fairly large scale, especially in the Bitkow area; they have also purchased refineries at Drohobycz. The production of petrol from natural gas has reached 350 tons per month, and an increase to 800 tons per month is anticipated in 1925. A pipe line 43 kilometres in length was laid between Daszawa and Drohobycz for the conveying of natural gas to the Drohobycz refineries.

The net production of petroleum from Drohobycz, Jaslo, and Stanislawow amounted last year to 657,961 metric tons, as compared with 632,044 metric tons and 517,873 metric tons respectively in 1923 and 1922. The bulk of petroleum, however, came from Drohobycz, where the production amounted to 564,641 metric tons.

# Commercial Intelligence

***The following are taken from printed reports, but we cannot be responsible for any errors that may occur.***

## County Court Judgments

*[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry make no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]*

DOWNES (ALBERT EDWARD, and WIFE), 5, Park Terrace, Rawdon, drug tablet maker. (C.C., 20/6/25.) £36 9s. May 11.

SEDDON BROS., Green Lane, Hull, paint manufacturers. (C.C., 20/6/25.) £27 9s. 4d, April 29, and £34 6s., May 6.

## Bill of Sale

WOODS (CHARLES), 40, Pine Street, Norton, formerly of 77, Station Road, Norton, analytical chemist. (B.S., 20/6/25.) Re-registration June 12, 1925, of bill of sale for £175, filed August 26, 1920.

## Mortgages and Charges

***[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]***

KEELINGS OXIDES (1921), LTD., London, S.W. (M., 20/6/25.) Reg. June 3, £10,100 debs. part of £50,000; general charge. *£30,000. February 2, 1924.

THIEL ROGERS AND CO., LTD., London, E.C., druggists' sundriesmen. (M., 20/6/25.) Reg. June 3, £600 debs. (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £350; general charge; also reg. June 3, £150, balance of £1,200; general charge.

## London Gazette, &c.

### Companies Winding Up Voluntarily

CHEMICAL SALT CO., LTD. (C.W.U.V., 20/6/25.) By special resolution passed May 19, and confirmed June 9, M. G. M'Adam, chartered accountant, Glasgow, appointed liquidator. Meeting of creditors at the office of M'Adam and Shaw, C.A., 190, West George Street, Glasgow, on Thursday, June 25, at 12 noon. (This meeting is a formal one. All creditors are being paid in full.)

NEW MOTOR SPIRIT CO., LTD. (C.W.U.V., 20/6/25.) W. H. Cork, 19, Eastcheap, London, appointed Liquidator, June 4. Meeting of creditors at liquidator's office, on Tuesday, June 23, at 2.15 p.m.

## New Companies Registered

QUEBEC INDUSTRIAL ALCOHOL, LTD.—To manufacture, distil, methylate, buy and sell and deal in alcohol and the by-products thereof, etc. Nominal capital, $2,000,000 in 200,000 shares of $10 each. The chief place of business is at Montreal. The British address is at 141, Moorgate Street, London.

SPRINGHEAD VARNISH COMPANY, LTD. (206,565.) Pte. co. Reg. June 10th. Capital £5,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in varnish, oils, paints, dryers, distempers, water paints, etc. The first directors are: A. C. Wilby, Stonewood House, Delph, near Oldham, paper maker; K. C. Wilby, Stonewood House, Delph, near Oldham, paper stainer; T. B. M. Parr, 32, Bradley Fold, Ainsworth, near Bolton, secretary; W. Gammage, 70, Stanley Road, Hollinwood, near Oldham, varnish maker; J. W. Tippett, Rimington, Ainsworth Road, Starling, near Bury, paper stainer; J. A. Wilby, 13, Oxberry Avenue, Fulham, S.W.6, paper stainer; Qualification: 250 shares. Solicitor: G. F. Tanner, 20, Clegg Street, Oldham. Registered office: Springhead Mill, Oldham Road, Springhead, Yorks.

## Chemical Trade Inquiries

***The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.***

POWDERED COAL PLANT AND METERS.—A commission agent in Gothenburg desires to represent British manufacturers of all classes of meters, thermometers, water meters, ale meters and gas meters, and would also like to represent a British firm manufacturing plant for the utilisation of crushed coal fuel. (Reference No. 715.)

LAUNDRY SOAP.—A firm in Port-au-Prince is desirous of getting into touch with British manufacturers or exporters of yellow laundry soap in bars. (Reference No. 720.)

TARRED SLAG MACADAM.—Tenders invited for the supply of 1,900 tons for Bromley Rural District Council, to Mr. L. O. Wall, Park House, Bromley, Kent, by July 6.

SEWAGE DISPOSAL PLANT.—Tenders are invited for the construction of percolating filters, humus tanks, etc., for Dewsbury Corporation. Particulars from Mr. H. Dearden, borough engineer, and tenders to Mr. H. Booth, town clerk, Dewsbury, by July 13.

CHEMICALS.—A firm of commission agents in Warsaw desires to represent British manufacturers of technical chemicals and raw materials for druggists, metals such as tin, aluminium, lead, antimony and nickel. (Reference No. 740.)

INDUSTRIAL CHEMICALS.—A British subject in Stockholm desires to represent British manufacturers of pulp and paper mill requisites, varnish, salt cake, oils, industrial chemicals, rosin, and bleaching powder. (Reference No. 744.)

## Tariff Changes.

ANTIGUA.—An Ordinance removes from the free list of imports machinery oil to be used as fuel for industrial oil engines and imposes a duty on such oil of 10 per cent. *ad valorem* under the British Preferential Tariff, and 15 per cent. *ad valorem* under the general tariff.

CZECHOSLOVAKIA.—The following goods may now be imported without licence:—Beet and cane sugar, glucose, starch sugar, etc., molasses, sodium carbonate (raw or crystallised), soda (calcined), silicate of soda (liquid), artificial calcium carbonate, artificial calcium phosphate, strontium nitrate, barium nitrate, potato starch.

An import licence is now necessary for burnt and washed lime.

FINLAND.—All kinds of fertilisers may now be imported without hindrance.

GERMANY.—The following may now be imported into Germany without licence:—Palm oil; yellow ochre, bolus, sienna and verona earths (crude); crude glycerin; paraffin ointment; vaseline; lanoline and compounds; moulded articles of stearine, paraffin wax, etc.; compounds of selenium slime (*selenschlamm*), tellurium, lithium, uranium, nickel, pyridin, and other pyridine bases.

GREECE.—Export of bones and horn has been prohibited in the interests of the fertiliser industry.

HUNGARY.—The Government has been petitioned for the temporary suspension of the duty on copper vitriol in order to facilitate importation. Wine growers are asking this concession.

TRINIDAD.—The following export duties are now imposed on asphalt:—Crude pitch or asphaltum, per ton 5s.; liquid pitch or asphaltum, per 240 gallons 5s.; boiled pitch or asphaltum, per ton 7s. 6d.; dried pitch or asphaltum, per ton 6s. 11d.